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ANNUAL REPORT  
OF THE  
TRANSIT DEPARTMENT



OF THE  
CITY OF BOSTON

1934

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1934



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COMPLIMENTS OF

TRANSIT DEPARTMENT—CITY OF BOSTON

THOMAS F. SULLIVAN, *Chairman,*  
JOHN F. McDONALD,  
ARTHUR V. SULLIVAN,  
*Commissioners.*



# REPORT

OF THE

# TRANSIT DEPARTMENT

FOR THE

YEAR ENDING DECEMBER 31, 1934



CITY OF BOSTON  
PRINTING DEPARTMENT  
1935



\*  
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Estate of James B. Hoyer

Dec. 30, 1949





ANNUAL REPORT  
OF THE  
TRANSIT DEPARTMENT

FOR THE YEAR ENDING DECEMBER 31, 1934.

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1 BEACON STREET, BOSTON, MASS., January 1, 1935.

*To the Mayor and City Council of the City of Boston:*

The Transit Department submits the following report for the year ending December 31, 1934.

SUMNER TUNNEL.

The vehicular tunnel between Boston proper and East Boston authorized by Chapter 297 of the Acts of the Legislature of 1929 was completed on June 30. Following a program of appropriate exercises, His Honor Mayor Frederick W. Mansfield declared that this important public work shall be known officially as the Sumner Tunnel in perpetuation of the memory of General William H. Sumner, and at 12 o'clock noon opened the tunnel to public travel.

The Act authorizing the construction of this tunnel provided that upon completion the Public Works Department of the City should operate it as a toll tunnel, and such operation began officially at the hour and day of opening above stated.

Construction work began on March 23, 1931. The tunnel from portal to portal is 5,650 feet long, and, including inclines and plazas, approximately 6,600 feet or a mile and a quarter. It is a circular cross section with an outside diameter of 31 feet,

the outer shell consisting of pressed steel  $\frac{3}{8}$  inch thick, reinforced with 45-pound tee rails, with an inside shell of 18 inches of reinforced concrete, leaving the inside diameter of the tunnel 28 feet. The roadway is 21 feet 6 inches wide between curbs, being built of granite block pavement with grouted joints. The vertical clearance from the roadway to the reinforced concrete roof is 13 feet 6 inches. The maximum grades inside the tunnel are 4.2 per cent on the Boston side and 3.4 per cent on the East Boston side. The bottom of the tunnel is approximately 86 feet below mean low water and approximately 50 feet below the bottom of the Harbor.

Some of the more important quantities used in construction are earth excavation about 178,000 cubic yards; concrete, mostly reinforced, about 50,000 cubic yards; steel and reinforcing rods, about 2,323 tons; wall tiling, about 116,000 square feet; wiring for operating the tunnel, approximately 675 miles. Two four-story brick and concrete buildings have been provided in which have been installed ventilation equipment to remove gases and fumes, one on the East Boston side and one on the Boston side, each containing 14 fans, or a total of 28 fans each of about 90,000 cubic feet per minute capacity. The shield-driven portion of the tunnel is about 4,800 feet in length, a belt conveyor being used throughout to remove the excavated material and reaching at the last stage of construction the entire length.

Other equipment installed consists of traffic signal lights, telephone system, fire hose, fire extinguisher and signals, pumping system, devices for checking toll collections, administration building, garage for emergency repair trucks, toll and police booths.

In order to provide adequate approaches and plazas it was necessary to widen Cross and North streets on the Boston side and Porter, London and Havre streets on the East Boston side, approximately 250 parcels of land being acquired by eminent domain for this purpose at a cost of \$5,600,000.

#### HAYMARKET SQUARE IMPROVEMENT.

The work necessary for the street widenings and for the construction of the traffic circle in Haymarket square has progressed steadily. Included in this work have been the building of new sewers and drains, the filling in of cellars of buildings removed, relocation of underground structures by

public service companies, new service and high pressure water pipe lines, street paving and construction of the traffic circle and sub-passageways. At the present rate of progress it is expected that this entire work will be completed July 1 of the coming year.

In order to provide for street widening in the construction of the traffic circle, it was necessary to acquire by eminent domain forty-five parcels of land, the expense thereof to date being \$1,500,000.

### DORCHESTER RAPID TRANSIT.

#### CEDAR GROVE CEMETERY BRIDGE.

A suit has been brought by the Proprietors of the Cedar Grove Cemetery against the City of Boston to compel the City to maintain a bridge over the Dorchester Rapid Transit Extension connecting the two parts of the cemetery.

A recommendation was made by the Law Department of the City for settlement of this case on the basis of the construction by this Department of a new bridge, in the location of the existing bridge which joins the two sections of the cemetery, at a cost estimate not to exceed \$3,000; one-half of such cost to be paid by the Proprietors of the cemetery and the other half to be charged to the cost of the construction of the Dorchester Rapid Transit, the cemetery corporation to maintain and keep in repair such bridge when constructed. This Department adopted this recommendation and built the bridge, the total cost being \$2,478.93. The Proprietors of Cedar Grove Cemetery reimbursed this Department by one-half of such cost, or \$1,239.46.

#### SAVIN HILL STATION.

At the request of the Boston Elevated Railway Company the Department is engaged in the construction of an overpass and coachway to Savin Hill Station of the Dorchester Rapid Transit with a canopy over the coachway platform, and in the work of extending the platform on the southerly end of Savin Hill Station.

#### FIELDS CORNER STATION.

The Department is engaged at the request of the Boston Elevated Railway Company in constructing, for use as a part of the Dorchester Rapid Transit Extension premises, a

division of the passageway leading from Charles street to the loading platform on the lower level of the Fields Corner Station, with incidental changes in stairways and barriers so that this passageway may be used for an entrance and exit.

#### MATTAPAN STATION.

The Department is carrying on, by request of the Boston Elevated Railway Company, the work of extending the canopy over a portion of the bus platform at Mattapan Station.

### TREMONT STREET SUBWAY ALTERATIONS.

#### HAYMARKET SQUARE.

The value of the traffic circle now under construction in Haymarket square would be considerably diminished were the Haymarket surface station of the Tremont Street Subway permitted to remain, as it would seriously obstruct the clear view of motorists passing through this section.

With the approval of His Honor the Mayor and the Boston Elevated Railway Company this structure is being altered, much in the same manner as the entrances in Scollay square and Adams square, by removing the existing surface entrance and exit building and erecting in place thereof two low stairway coverings over the entrance and exit stairways at this location.

#### PERSONNEL OF COMMISSION.

On January 16 Arthur B. Corbett resigned as Transit Commissioner and was succeeded on January 17 by Arthur V. Sullivan.

On January 26 Nathan A. Heller resigned as Transit Commissioner and was succeeded on January 30 by John F. McDonald.

#### LEGISLATION.

Under authority of Chapter 46 of the Resolves of 1933 the Metropolitan Planning Division of the Metropolitan District Commission and the Transit Department, sitting jointly, were authorized and directed to investigate and report in relation to the improvement and expansion of business and residential conditions in those sections of Boston known as Roxbury, Jamaica Plain and Forest Hills by the removal of the Elevated structure in those sections.

The text of Chapter 46 follows:

## [CHAPTER 46.]

RESOLVE PROVIDING FOR AN INVESTIGATION LOOKING TO THE IMPROVEMENT AND EXPANSION OF BUSINESS AND RESIDENTIAL CONDITIONS IN THOSE SECTIONS OF BOSTON KNOWN AS ROXBURY, JAMAICA PLAIN AND FOREST HILLS, BY THE REMOVAL OF THE ELEVATED RAILWAY STRUCTURE IN SAID SECTIONS.

*Resolved*, That the metropolitan planning division of the metropolitan district commission and the transit department of the city of Boston, acting jointly, are hereby authorized and directed to investigate as to the desirability, feasibility and probable cost of the removal of the existing elevated railway structure of the Boston Elevated Railway Company in the city of Boston, between the southerly entrance of the Washington Street tunnel and Forest Hills station; and as to the desirability, route and probable cost of a tunnel, subway or such other means of rapid transit as would be an adequate substitute for said elevated structure. Said metropolitan planning division and said transit department, acting jointly, shall report to the general court the results of their investigation and their recommendations, if any, together with drafts of legislation necessary to carry said recommendations into effect, by filing the same with the clerk of the house of representatives not later than the fifteenth day of December, nineteen hundred and thirty-four.

*Approved July 12, 1933.*

The following report called for by the foregoing Resolve was submitted to the Senate and House of Representatives on December 15.

## HOUSE NO. 300.

## THE COMMONWEALTH OF MASSACHUSETTS.

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SPECIAL REPORT OF THE DIVISION OF METROPOLITAN PLANNING AND THE TRANSIT DEPARTMENT OF THE CITY OF BOSTON RELATIVE TO THE IMPROVEMENT AND EXPANSION OF BUSINESS AND RESIDENTIAL CONDITIONS IN THOSE SECTIONS OF BOSTON KNOWN AS ROXBURY, JAMAICA PLAIN AND FOREST HILLS BY THE REMOVAL OF THE ELEVATED RAILWAY STRUCTURE IN SAID SECTIONS.

[Transportation.]

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DECEMBER 15, 1934.

*To the Honorable Senate and House of Representatives in General Court assembled.*

Chapter 46 of the Resolves of 1933 reads as follows:

RESOLVE PROVIDING FOR AN INVESTIGATION LOOKING TO THE IMPROVEMENT AND EXPANSION OF BUSINESS AND RESIDENTIAL CONDITIONS IN THOSE SECTIONS OF BOSTON KNOWN AS ROXBURY, JAMAICA PLAIN AND FOREST HILLS, BY THE REMOVAL OF THE ELEVATED RAILWAY STRUCTURE IN SAID SECTIONS.

*Resolved*, That the metropolitan planning division of the metropolitan district commission and the transit department of the city of Boston, acting jointly, are hereby authorized and directed to investigate as to



the desirability, feasibility and probable cost of the removal of the existing elevated railway structure of the Boston Elevated Railway Company in the city of Boston, between the southerly entrance of the Washington Street tunnel and Forest Hills station; and as to the desirability, route and probable cost of a tunnel, subway or such other means of rapid transit as would be an adequate substitute for said elevated structure. Said metropolitan planning division and said transit department, acting jointly, shall report to the general court the results of their investigation and their recommendations, if any, together with drafts of legislation necessary to carry said recommendations into effect, by filing the same with the clerk of the house of representatives not later than the fifteenth day of December, nineteen hundred and thirty-four.

In accordance with this resolve, the Division of Metropolitan Planning and the Boston Transit Department herewith present their report.

The subject matter of the resolve is the removal of the elevated structure along Washington Street from the southerly entrance of the Washington Street tunnel to Forest Hills, and the substitution therefor of a subway.

A hearing was held on October 1, 1934, in the hearing room at 20 Somerset Street before the members of the Division of Metropolitan Planning and the Boston Transit Department. Both Boards were well represented and the hearing was attended by seventy-five residents and property owners along Washington Street, some from the section lying in Boston proper, some from the Roxbury section, and some from the West Roxbury and Forest Hills District.

All who desired to speak were heard, and all who spoke favored the removal of the elevated structure and the substitution therefor of a subway following the Washington Street route. No one favored any change in route and no one spoke in opposition to the Elevated's removal.

The length of the elevated structure involved is approximately 24,444 feet. It now stands on the books of the Elevated road at \$11,225,810.28, and if it were removed by the city, approximately that sum would have to be paid to the Boston Elevated Railway Company. That company could, however, use said payment to retire a part of its indebtedness, and while the removal of the old structure is a part of the cost of a substitute subway system, the lowering of the Elevated's indebtedness would result in a saving in the cost of service which would equal the payment of interest on the bonds which the city would issue to pay for the removal of the elevated structure.

A new subway to replace the present elevated structure on Washington Street, with suitable stations, connections and equipment, was studied and reported on in House Document No. 17 of 1924. The estimate therein made by the then Trustees of the Boston Elevated Railway Company was \$18,130,800. In the opinion of this Joint Board this cost may well be increased by \$5,000,000 at the present time to, say, \$23,000,000 for the subway and the removal of the present elevated structure. This is, of course, in addition to the \$11,000,000 plus which must be paid to the Elevated for taking their structure. The rental on \$23,000,000 at 4½ per cent would be \$1,035,000 per annum. This would be a net addition to the cost of service of the Elevated, and would fall either upon the Elevated car riders in the form of increased fares, or the district served by the Elevated in the form of added taxes. Against this cost there might be theoretically an asset in the form of betterment assessments.

upon the abutting property. The sum paid by the Elevated in land damages because of the construction of the Washington Street elevated structure was approximately \$5,405,000. It is, however, very doubtful whether anything like this sum could be assessed and collected in betterments, and we feel that as a practical matter betterment assessments cannot be counted on to reduce the burden of the Washington Street subway as a substitute for the Elevated road.

The above estimates cover the removal of the entire structure along Washington Street. It would, of course, be possible to remove the structure and substitute a subway from the southerly entrance of the Washington Street tunnel to a point beyond the cathedral. This would remove the structure from the narrow section of Washington Street, where probably the greatest property damage is caused. The cost of the removal of such a section of elevated road and the substitution of a subway is estimated to be approximately \$4,000,000 and to involve an annual rental of \$180,000. If this plan were carried out, it would prevent direct crossing on three streets which now intersect Washington Street, where the ramp from the proposed subway to the elevated structure would be constructed.

In considering the economic advisability of removing the elevated structure on Washington Street, and the substituting of a subway therefor, we are forced to consider, as well, needed expenditures for the construction of rapid transit extensions to portions of the metropolitan area which do not now have such service. Among these desirable additions to rapid transit service are an extension of the East Boston tunnel to Day Square and Orient Heights; an extension of rapid transit service from Lechmere Square through Somerville and North Cambridge to Arlington; an extension of the Washington Street rapid transit lines from Forest Hills to Spring Street, West Roxbury; a subway under Huntington Avenue, at least as far as Massachusetts Avenue, and a trolley and vehicular overpass on Commonwealth Avenue at the Boston end of the Cottage Farm bridge. All of these extensions would be much in the public interest, if we could afford them, and the cost of the entire group would not be much more than the cost of removing the elevated structure from Washington Street.

We must also recognize that if action were taken to remove the elevated structure from Washington Street, there would be an equal demand and obligation to remove the elevated structures from Atlantic Avenue, Beach Street and Harrison Avenue in Boston, and from Causeway Street, the Charlestown bridge and Main Street in Charlestown. The removal of these structures would necessitate a payment to the Elevated of approximately \$10,228,117.85. Their removal would also necessitate the construction of a new subway from the northerly end of the Washington Street tunnel, under the North Station, and the Charles River to Sullivan Square at a cost of approximately \$10,000,000.

In summary, it will be seen that the removal of the elevated structures on Washington Street, the Atlantic Avenue loop, and from the North Station to Sullivan Square, would involve total payments to the Elevated of approximately \$21,500,000 and total subway construction costs of possibly as much as \$33,000,000. The entire work would thus entail a total expenditure of about \$54,600,000.

It would have been much better had subways been constructed instead of elevated structures, even at a much increased initial cost. Notwithstanding those elevated roads furnished speedy transportation to towns north and south, they badly damaged real estate on the streets through which they passed, and retarded to a very considerable degree the proper development of the South End, Roxbury and Charlestown.

We recognize that the trend of population is away from the center of the city to the suburbs, but there will always be a very considerable population that desire to live in the South End and in Charlestown, which are within a short distance of the central portion of the city. There will be no desirable development of the South End and Charlestown as long as the elevated structure remains. Its removal would permit a gradual development of the section along wise lines, and might prevent the further downward trend of realty values.

The questions naturally arise: Has the city sustained serious loss through the depreciation in real property values owing to the construction of elevated lines? If the elevated lines were removed and a subway substituted therefor would the value of real estate be enhanced sufficiently to warrant such great expenditures? With these questions in mind a study has been made of the assessed valuation of property on Washington Street in 1896 (five years before the elevated lines were opened); 1905, because it would seem that by that time the effect of the elevated structure should have become noticeable; 1915, after another ten years had elapsed; and finally in 1933, to compare previous conditions with the present day.

The first section of elevated structure was completed for operation from the Tremont Street subway to Guild Street June 10, 1901. The property south of Guild Street was unaffected by any elevated structure until the extension from Guild Street to Forest Hills was opened to traffic November 22, 1909. Therefore the year 1905 gives a fair idea of property values five years before, and the year 1915 five years after, the opening of the Forest Hills extension. Tables of valuations on this basis which have been prepared are not included in this report, but are available at the office of the Division of Metropolitan Planning. There is evidence that except around the stations there has been a depreciation in assessed values since 1905, while real estate values, generally speaking, throughout the city are much higher than they were twenty-eight years ago.

Were the city and the Elevated Company in proper financial condition to remove these structures, we should recommend such action. We cannot do so, however, with the Elevated showing a deficit and the city suffering from heavy taxes.

We do, however, believe that it would be wise to provide by law for the setting up of definite reserves to be used for rapid transit extensions and for the removal of the unsightly elevated structures. The territory served by the Boston Elevated Railway includes fourteen cities and towns whose assessed valuation is \$3,245,535,250. If a special tax of three-tenths of a mill, which would mean 30 cents on the tax rate, were imposed on this transit district there would be available each year approximately \$1,000,000 for rapid transit improvements without incurring debt. Or, if it were deemed desirable to make certain borrowings in order that any needed project might be carried through, temporary loans might be made and



speedily paid off out of the reserve accumulated, as above suggested. We believe that such action would be very wise from the public standpoint, and this proposal has been included in the annual recommendations of the Division of Metropolitan Planning to the General Court, and enabling legislation for this proposal accompanies those general recommendations (see House, Nos. 52, 53, 54 and 55 of 1935).

Respectfully submitted,

DIVISION OF METROPOLITAN PLANNING.

JOHN C. KILEY, *Chairman*.

FREDERIC H. FAY.

WILSON MARSH.

RICHARD K. HALE.

ABRAHAM C. WEBBER.

WILLIAM F. ROGERS.

HENRY I. HARRIMAN, *Director*.

BOSTON TRANSIT DEPARTMENT.

THOMAS F. SULLIVAN, *Chairman*.

ARTHUR V. SULLIVAN.

JOHN F. McDONALD.

Mr. Webber dissents, and refers to his statement filed with the recommendations of the Division of Metropolitan Planning contained in the portion of its annual report filed with the Secretary of State (see House No. 52 of 1935).

SINKING FUNDS.

The following is the condition of the debt and of the sinking funds for the various divisions of the work of the Department at the date of this report, as stated by the City Treasurer:

SUBWAY (INCLUDING ALTERATIONS).

(Debt, \$4,366,000, outside debt limit.)

Amount of fund January 1, 1934 . . . . .	\$3,991,988 00
Received:	
Interest on investments January 1, 1934	
to date . . . . .	\$164,708 57
Premium on investments January 1, 1934	
to date . . . . .	1,013 88
Revenue, etc., January 1, 1934 to date . . . . .	118 00
	<hr/>
	165,840 45
	<hr/>
	\$4,157,829 05
Paid:	
City Treasurer, Redemption of Rapid	
Transit Debt, January 1, 1934 to date, . . . . .	\$50,000 00
Interest on investments purchased January	
1, 1934 to date . . . . .	2,201 60
Premium on investments purchased Janu-	
ary 1, 1934 to date . . . . .	4,028 10
	<hr/>
	56,229 70
	<hr/>
	<u>\$4,101,599 35</u>

## CHARLESTOWN BRIDGE, NO. 1.

*(Debt, \$740,000, inside debt limit.)*

Amount of fund January 1, 1934 . . . . .		\$696,469 91
Received:		
Interest on investments January 1, 1934 to date . . . . .	\$28,075 14	
Revenue, etc., January 1, 1934 to date . . . . .	1,530 00	
		<u>29,605 14</u>
		\$726,075 05
Paid:		
City Treasurer, Redemption of Charlestown Bridge Debt No. 1, January 1, 1934 to date . . . . .	\$10,000 00	
Interest on investments purchased January 1, 1934 to date . . . . .	122 75	
Premium on investments purchased January 1, 1934 to date . . . . .	465 11	
		<u>10,587 86</u>
		<u>\$715,487 19</u>

## CHARLESTOWN BRIDGE, NO. 2.

*(Debt, \$665,000, outside debt limit.)*

Amount of fund January 1, 1934 . . . . .		\$665,000 00
Received:		
Interest on investments January 1, 1934 to date . . . . .	\$27,284 29	
Premium on investments January 1, 1934 to date . . . . .	62 22	
		<u>27,346 51</u>
		\$692,346 51
Paid:		
Interest on investments purchased January 1 1934 to date . . . . .	\$688 89	
Premium on investments purchased January 1, 1934 to date . . . . .	151 71	
Transferred to "Moneys for Reduction of Debt," being excess of funds over amount of debt . . . . .	26,505 91	
		<u>27,346 51</u>
		<u>\$665,000 00</u>

## BOSTON TUNNEL AND SUBWAY.

*(Debt, \$8,346,700, outside debt limit.)*

Amount of fund January 1, 1934 . . . . .		\$4,535,983 42
Received:		
Interest on investments January 1, 1934 to date . . . . .	\$183,491 87	
Premium on investments January 1, 1934 to date . . . . .	253 47	
Revenue, etc., January 1, 1934 to date . . . . .	122,245 00	
Appreciation of investments January 1, 1934 to date . . . . .	5,600 00	
		<u>311,590 34</u>
		\$4,847,573 76
Paid:		
Interest on investments purchased January 1, 1934 to date . . . . .	\$1,822 60	
Premium on investments purchased January 1, 1934 to date . . . . .	4,163 46	
		<u>5,986 06</u>
		<u>\$4,841,587 70</u>

## CAMBRIDGE CONNECTION.

*(Debt, \$1,648,000, outside debt limit.)*

Amount of fund, January 1, 1934 . . . . .		\$551,784 61
Received:		
Interest on investments January 1, 1934		
to date . . . . .	\$23,183 43	
Revenue, etc., January 1, 1934 to date . . . . .	10,292 30	33,475 73
		<u>\$585,260 34</u>

## BOYLSTON STREET SUBWAY.

*(Debt, \$5,458,000, outside debt limit.)*

Amount of fund January 1, 1934 . . . . .		\$264,730 20
Received:		
Interest on investments January 1, 1934		
to date . . . . .	\$13,028 75	
Revenue, etc., January 1, 1934 to date . . . . .	14,067 37	27,096 12
		<u>\$291,826 32</u>
Paid:		
Interest on investments purchased January 1, 1934 to date . . . . .	\$272 38	
Premium on investments purchased January 1, 1934 to date . . . . .	1,216 07	1,488 45
		<u>\$290,337 87</u>

## DORCHESTER TUNNEL.

*(Debt, \$12,160,000, outside debt limit.)*

Amount of fund January 1, 1934 . . . . .		\$1,080,128 97
Received:		
Interest on investments January 1, 1934		
to date . . . . .	\$44,045 75	
Revenue, etc., January 1, 1934 to date . . . . .	51,694 83	95,740 58
		<u>\$1,175,869 55</u>
Paid:		
Interest on investments purchased January 1, 1934 to date . . . . .	\$861 95	
Premium on investments purchased January 1, 1934 to date . . . . .	300 93	1,162 88
		<u>\$1,174,706 67</u>

## EAST BOSTON TUNNEL ALTERATIONS.

*(Debt, \$3,900,000, outside debt limit.)*

Amount of fund January 1, 1934 . . . . .		\$137,054 42
Received:		
Interest on investments, January 1, 1934		
to date . . . . .	\$5,381 98	
Revenue, etc., January 1, 1934 to date . . . . .	10,610 94	15,992 92
		<u>\$153,047 34</u>

## EAST BOSTON TUNNEL EXTENSION.

*(Debt, \$2,500,000, outside debt limit.)*

Amount of fund January 1, 1934 . . . . .		\$373,473 97
Received:		
Interest on investments January 1, 1934		
to date . . . . .	\$15,295 13	
Revenue, etc., January 1, 1934 to date . . . . .	6,413 94	
		<hr/> 21,709 07
		<hr/> <u>\$395,183 04</u>

## ARLINGTON STATION.

*(Debt, \$1,248,000, outside debt limit.)*

Amount of fund January 1, 1934 . . . . .		\$12,195 40
Received:		
Interest on investments January 1, 1934		
to date . . . . .		447 50
		<hr/> \$12,642 90
		<hr/> <u>\$12,642 90</u>

## DORCHESTER RAPID TRANSIT.

*(Debt, \$10,910,000, outside debt limit.)*

Amount of fund, January 1, 1934 . . . . .		\$219,840 40
Received:		
Interest on investments January 1, 1934		
to date . . . . .	\$8,608 06	
Revenue, etc., January 1, 1934 to date . . . . .	58,237 75	
		<hr/> 66,845 81
		<hr/> \$286,686 21
Paid:		
Interest on investments purchased . . . . .		406 25
		<hr/> \$286,279 96
		<hr/> <u>\$286,279 96</u>

## EAST BOSTON TUNNEL.

*(Debt, \$3,334,000, outside debt limit.)*

Amount of fund January 1, 1934 . . . . .		\$2,311,535 85
Received:		
Interest on investments January 1, 1934		
to date . . . . .	\$90,499 50	
Revenue, etc., January 1, 1934 to date . . . . .	4,937 00	
		<hr/> 95,436 50
		<hr/> \$2,406,972 35
Paid:		
Interest on investments purchased January 1, 1934 to date . . . . .	\$1,166 95	
Premium on investments purchased January 1, 1934 to date . . . . .	1,896 59	
		<hr/> 3,063 54
		<hr/> <u>\$2,403,908 81</u>

## HYDE PARK STREET RAILWAY.

*(Debt, \$322,000, outside debt limit.)*

Amount of fund January 1, 1934 . . . . .		\$102,171 06
Received:		
Interest on investment January 1, 1934		
to date . . . . .	\$3,971 82	
Appropriation for debt January 1, 1934		
to date . . . . .	7,774 00	
	<hr/>	11,745 82
		<hr/>
		\$113,916 88
Paid:		
Interest on investments purchased January 1, 1934 to date	\$615 88	
Premium on investments purchased January 1, 1934 to date . . . . .	495 28	
	<hr/>	1,111 16
		<hr/>
		<u>\$112,805 72</u>

## TREMONT STREET SUBWAY ALTERATIONS — ACTS OF 1924.

*(Debt, \$115,000, outside debt limit.)*

(No fund.)

## EAST BOSTON TUNNEL ALTERATIONS — ACTS OF 1924.

*(Debt, \$20,000, outside debt limit.)*

(No fund.)

## BOYLSTON STREET SUBWAY — ACTS OF 1930.

*(Debt, \$4,935,000, outside debt limit.)*

(No fund.)

## TRAFFIC TUNNEL.

*(Debt, \$16,000,000, outside debt limit.)*

(No fund.)

## TRAFFIC TUNNEL—SERIES B.

*(Debt, \$2,500,000, outside debt limit.)*

(No fund.)

# RENTAL BILLS RENDERED TO THE BOSTON ELEVATED RAILWAY COMPANY.

The following is a statement of the bills rendered for rental of the various tunnels and subways:

## TREMONT STREET SUBWAY.

March 31, 1934:		
Net cost of subway . . . . .	\$4,215,603 97	
Rental for one quarter . . . . .		\$47,425 54
Alterations: Net cost . . . . .	\$242,673 93	
Rental for one quarter . . . . .		2,730 08
June 30, 1934:		
Net cost of subway . . . . .	4,215,603 97	
Rental for one quarter . . . . .		47,425 54
Alterations: Net cost . . . . .	242,673 93	
Rental for one quarter . . . . .		2,730 08
September 30, 1934:		
Net cost of subway . . . . .	4,215,795 95	
Rental for one quarter . . . . .		47,427 71
Alterations: Net cost . . . . .	242,673 93	
Rental for one quarter . . . . .		2,730 08
December 31, 1934:		
Net cost of subway . . . . .	4,216,088 75	
Rental for one quarter . . . . .		47,431 00
Alterations: Net cost . . . . .	242,673 93	
Rental for one quarter . . . . .		2,730 08
		<u>\$200,630 11</u>

## DORCHESTER RAPID TRANSIT.

March 31, 1934:		
Net cost of premises . . . . .	\$10,913,893 89	
Rental for one quarter . . . . .		\$122,781 31
June 30, 1934:		
Net cost of premises . . . . .	10,920,288 86	
Rental for one quarter . . . . .		122,853 25
September 30, 1934:		
Net cost of premises . . . . .	10,920,584 68	
Rental for one quarter . . . . .		122,856 58
December 31, 1934:		
Net cost of premises . . . . .	10,941,066 32	
Rental for one quarter . . . . .		123,087 00
		<u>\$491,578 14</u>

## CAMBRIDGE CONNECTION.

March 31, 1934:		
Net cost of connection . . . . .	\$1,653,270 99	
Rental for one quarter . . . . .		\$18,599 30
June 30, 1934:		
Net cost of connection . . . . .	1,653,270 99	
Rental for one quarter . . . . .		18,599 30
September 30, 1934:		
Net cost of connection . . . . .	1,653,270 99	
Rental for one quarter . . . . .		18,599 30
December 31, 1934:		
Net cost of connection . . . . .	1,653,270 99	
Rental for one quarter . . . . .		18,599 30
		<u>\$74,397 20</u>



## WASHINGTON STREET TUNNEL.

March 31, 1934:			
Net cost of tunnel	. . . .	\$7,947,250 65	
Rental for one quarter	. . . .		\$89,406 57
June 30, 1934:			
Net cost of tunnel	. . . .	7,947,250 65	
Rental for one quarter	. . . .		89,406 57
September 30, 1934:			
Net cost of tunnel	. . . .	7,947,250 65	
Rental for one quarter	. . . .		89,406 57
December 31, 1934:			
Net cost of tunnel	. . . .	7,947,250 65	
Rental for one quarter	. . . .		89,406 57
			<u>\$357,626 28</u>

## EAST BOSTON TUNNEL.

March 31, 1934:			
Net cost of tunnel	. . . .	\$3,404,929 43	
Rental for one quarter	. . . .		\$38,305 45
June 30, 1934:			
Net cost of tunnel	. . . .	3,405,179 35	
Rental for one quarter	. . . .		38,308 27
September 30, 1934:			
Net cost of tunnel	. . . .	3,408,303 84	
Rental for one quarter	. . . .		38,343 42
December 31, 1934:			
Net cost of tunnel	. . . .	3,409,767 17	
Rental for one quarter	. . . .		38,359 88
			<u>\$153,317 02</u>

## BOYLSTON STREET SUBWAY.

March 31, 1934:			
Net cost of subway	. . . .	\$5,306,405 61	
Rental for one quarter	. . . .		\$59,697 06
June 30, 1934:			
Net cost of subway	. . . .	5,308,434 76	
Rental for one quarter	. . . .		59,719 89
September 30, 1934:			
Net cost of subway	. . . .	5,308,489 99	
Rental for one quarter	. . . .		59,720 51
December 31, 1934:			
Net cost of subway	. . . .	5,308,489 99	
Rental for one quarter	. . . .		59,720 51
			<u>\$238,857 97</u>

## EAST BOSTON TUNNEL EXTENSION.

March 31, 1934:			
Net cost of extension	. . . .	\$2,345,338 93	
Rental for one quarter	. . . .		\$26,385 06
June 30, 1934:			
Net cost of extension	. . . .	2,345,338 93	
Rental for one quarter	. . . .		26,385 06
September 30, 1934:			
Net cost of extension	. . . .	2,345,338 93	
Rental for one quarter	. . . .		26,385 06
December 31, 1934:			
Net cost of extension	. . . .	2,345,338 93	
Rental for one quarter	. . . .		26,385 06
			<u>\$105,540 24</u>

## DORCHESTER TUNNEL.

March 31, 1934:		
Net cost of tunnel . . . .	\$12,204,334 19	
Rental for one quarter . . . .		\$137,298 76
June 30, 1934:		
Net cost of tunnel . . . .	12,205,785 05	
Rental for one quarter . . . .		137,315 12
September 30, 1934:		
Net cost of tunnel . . . .	12,205,821 97	
Rental for one quarter . . . .		137,315 50
December 31, 1934:		
Net cost of tunnel . . . .	12,207,380 49	
Rental for one quarter . . . .		137,333 03
		<u>\$549,262 41</u>

## ARLINGTON STATION.

March 31, 1934:		
Net cost of station . . . .	\$1,227,371 06	
Rental for one quarter . . . .		\$13,807 93
June 30, 1934:		
Net cost of station . . . .	1,227,614 40	
Rental for one year . . . .		13,810 66
September 30, 1934:		
Net cost of station . . . .	1,227,614 40	
Rental for one quarter . . . .		13,810 66
December 31, 1934:		
Net cost of station . . . .	1,227,614 40	
Rental for one quarter . . . .		13,810 66
		<u>\$55,239 91</u>

## EAST BOSTON TUNNEL ALTERATIONS.

March 31, 1934:		
Net cost of alterations . . . .	\$3,830,927 35	
Rental for one quarter . . . .		\$43,097 93
June 30, 1934:		
Net cost of alterations . . . .	3,830,993 25	
Rental for one quarter . . . .		43,098 67
September 30, 1934:		
Net cost of alterations . . . .	3,833,759 48	
Rental for one quarter . . . .		43,129 79
December 31, 1934:		
Net cost of alterations . . . .	3,836,563 31	
Rental for one quarter . . . .		43,161 34
		<u>\$172,487 73</u>

## HYDE PARK STREET RAILWAY.

March 31, 1934:		
Net cost of premises . . . .	\$231,099 45	
Rental for one quarter . . . .		\$2,599 87
June 30, 1934:		
Net cost of premises . . . .	231,099 45	
Rental for one quarter . . . .		2,599 87
September 30, 1934:		
Net cost of premises . . . .	231,099 45	
Rental for one quarter . . . .		2,599 87
December 31, 1934:		
Net cost of premises . . . .	231,099 45	
Rental for one quarter . . . .		2,599 87
		<u>\$10,399 48</u>



## BOYLSTON STREET SUBWAY — ACTS 1930.

Based on annual interest requirements . . . . .	\$201,922 58
One-half of one per cent of net cost, (\$4,915,825.91) . . . . .	24,579 13
Rental due under requirements of Chapter 394, Acts of 1930, from July 1, 1933 to June 30, 1934 . . . . .	<u>\$226,501 71</u>

## TOTALS.

Tremont Street Subway . . . . .	\$200,630 11 .
Dorchester Rapid Transit . . . . .	491,578 14 .
Cambridge Connection . . . . .	74,397 20 .
Washington Street Tunnel . . . . .	357,626 28 .
East Boston Tunnel . . . . .	153,317 02 .
Boylston Street Subway . . . . .	238,857 97 .
East Boston Tunnel Extension . . . . .	105,540 24 .
Dorchester Tunnel . . . . .	549,262 41 .
Arlington Station . . . . .	55,239 91 .
East Boston Tunnel Alterations . . . . .	172,487 73 .
Hyde Park Street Railway . . . . .	10,399 48 .
Boylston Street Subway — Acts 1930 . . . . .	226,501 71 .
	<u>\$2,635,838 20</u>

## STATEMENT OF EXPENSES.

The following is a classified statement of the expenses of the Department for the year ending December 31, 1934:

## DORCHESTER TUNNEL.

Engineering Expenses:	
Skilled Service . . . . .	\$106 24

## SECTION C.

Engineering Expenses:	
Skilled Service . . . . .	\$21 82
Construction Expenses:	
Construction . . . . .	\$55 15
Labor . . . . .	145 62
	<u>200 77</u>
	222 59

## SECTION D.

Engineering Expenses:	
Skilled Service . . . . .	9 98

## SECTION F.

Engineering Expenses:	
Stationery — Supplies . . . . .	\$1 50
Construction Expenses:	
Construction . . . . .	\$208 23
Field Supplies . . . . .	23 63
Labor . . . . .	2,641 30
Tools . . . . .	113 19
	<u>2,986 35</u>
	2,987 85
	<u>\$3,326 66</u>

## BOYLSTON STREET SUBWAY.

## Engineering Expenses:

Huntington Avenue Subway — Acts 1933 . . . \$63 52

## SECTION 2.

## Engineering Expenses:

Skilled Service . . . \$135 79

## Construction Expenses:

Construction . . . \$671 75

Field Supplies . . . 39 66

Labor . . . 2,334 28

Tools . . . 75 67

3,121 36

3,257 15

## SECTION 4.

## Engineering Expenses:

Skilled Service . . . \$10 88

## Construction Expenses:

Construction . . . \$118 47

Field Supplies . . . 48 73

Labor . . . 1,337 51

Tools . . . 35 20

1,539 911,550 79\$4,871 46

## TREMONT STREET SUBWAY ALTERATIONS — ACTS 1924.

## Engineering Expenses:

Skilled Service . . . \$139 86

## Construction Expenses:

Construction . . . \$11 62

Labor . . . 178 28

Tools . . . 2 08

191 98

331 84

## Haymarket Square — Change Head-house:

Field Supplies . . . \$1 50

Skilled Service . . . 341 96

343 46\$675 30

## EAST BOSTON TUNNEL ALTERATIONS — ACTS 1924.

## Engineering Expenses:

Professional Advice . . . \$625 00

Stationery — Supplies . . . 3 30

\$628 30

## Construction Expenses:

Construction . . . \$1 05

Field Supplies . . . 68

Labor . . . 556 05

557 78

\$1,186 08

## Atlantic Station:

Construction . . . 937 00

## Devonshire Station:

Construction . . . \$263 80

Field Supplies . . . 335 21

Labor . . . 3,060 89

Tools . . . 56 94

3,716 84

## Court Street Pipe Crossing:

Field Supplies . . . 52 86

\$5,892 78

## ARLINGTON STATION.

Engineering Expenses:			
Skilled Service . . . . .	\$13 87		
Stationery—Supplies . . . . .	60		
	<hr/>	\$14 47	
Construction Expenses:			
Construction . . . . .	\$10 84		
Field Supplies . . . . .	20		
Labor . . . . .	217 83		
	<hr/>	228 87	
		<hr/>	\$243 34

## DORCHESTER RAPID TRANSIT.

Engineering Expenses . . . . .	\$141 66
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## SECTION 1.

Engineering Expenses:			
Skilled Service . . . . .	\$57 38		
Construction Expenses:			
Field Supplies . . . . .	\$1 89		
Credits:			
Autos . . . . .	\$6 00		
Construction . . . . .	90 43		
Labor . . . . .	13 18		
	<hr/>	109 61	
		<hr/>	Cr. 107 72

Savin Hill Station Overpass:			
Baker, Matz & Co. (Contract 1018) . . . . .	\$11,599 78		
Advertising . . . . .	\$52 55		
Construction . . . . .	306 52		
Labor . . . . .	1,331 47		
Property Damages—			
Takings . . . . .	6,616 36		
Skilled Service . . . . .	1,651 22		
Stationery Supplies, . . . . .	18 35		
Stenographers . . . . .	79 25		
	<hr/>	10,055 72	
		<hr/>	21,655 50
			<hr/>
			21,605 16

## SECTION 2.

Engineering Expenses:			
Skilled Service . . . . .	\$55 42		
Construction Expenses:			
Construction . . . . .	92 00		
Fields Corner Station:			
Construction . . . . .	\$22 02		
Field Supplies . . . . .	64 93		
Labor . . . . .	1,787 89		
Plumbing . . . . .	1,347 55		
Skilled Service . . . . .	161 00		
Stationery—Supplies . . . . .	3 60		
Tools . . . . .	123 57		
	<hr/>	3,510 56	
Fields Corner Stair Changes:			
Advertising . . . . .	\$64 67		
Construction . . . . .	216 32		
Field Supplies . . . . .	244 40		
	<hr/>		
Carried forward . . . . .	\$525 39	\$3,657 98	\$21,746 82

<i>Brought forward</i> . . . . .	\$525 39	\$3,657 98	\$21,746 82
Labor . . . . .	1,526 59		
Skilled Service . . . . .	99 25		
Stationery—Supplies . . . . .	1 80		
Tools . . . . .	54 03		
	<hr/>	2,207 06	
		<hr/>	5,865 04

SECTION 3.

Engineering Expenses:			
Skilled Service . . . . .		\$27 35	
Construction Expenses:			
Construction . . . . .	\$166 22		
Damages . . . . .	100 00		
Skilled Service . . . . .	5 24		
	<hr/>	271 46	
Shawmut Station:			
Construction . . . . .	\$393 87		
Field Supplies . . . . .	23 05		
Labor . . . . .	1,711 57		
Plumbing . . . . .	952 22		
Skilled Service . . . . .	1 81		
Stationery—Supplies . . . . .	65		
Tools . . . . .	75 46		
	<hr/>	3,158 63	
		<hr/>	3,457 44

SECTION 4.

Engineering Expenses:			
Professional Advice . . . . .		\$590 00	
Construction Expenses:			
Property Damages — Takings . . . . .		1,370 00	
Cedar Grove Bridge:			
Beacon Engineering Co. (Contract 1017) . . . . .		817 49	
Advertising . . . . .	\$5 00		
Flagging . . . . .	6 51		
Labor . . . . .	86 62		
Skilled Service . . . . .	322 80		
Stationery—Supplies, . . . . .	1 05		
	<hr/>	421 98	
		<hr/>	3,199 47

SECTION 5 C.

Mattapan Station:			
Engineering Expenses:			
Skilled Service . . . . .	\$38 09		
Stationery—Supplies, . . . . .	5 30		
	<hr/>	\$43 39	
Construction Expenses:			
Construction . . . . .	\$215 00		
Tools . . . . .	599 17		
	<hr/>	\$814 17	
Credits:			
Field Supplies . . . . .	\$0 48		
Property Damages			
— Takings . . . . .	240 00		
	<hr/>	240 48	
		<hr/>	573 69
			<hr/>
			617 08

## TRAFFIC TUNNEL.

General Expenses:		
Chief Clerk . . .	\$1,173 78	
Clerks and Stenographers . . .	1,603 26	
Commissioners . . .	6,746 88	
Conveyancer . . .	1,173 78	
Office Boy . . .	205 20	
Secretary . . .	1,901 94	
Office — Lighting . . .	160 50	
Printing . . .	132 60	
Rental . . .	2,666 68	
Stationery—		
Supplies . . .	209 55	
Telephone—		
Telegraph . . .	825 61	
	<hr/>	\$16,799 78
Transfers:		
To Traffic Tunnel —		
Series B . . . . .	8,459 97	
	<hr/>	\$8,339 81
From Traffic Tunnel		
— Series B . . . . .	2,715 03	
	<hr/>	\$11,054 84
Miscellaneous Bills—		
not subject to ap-		
portionment . . . . .	92 55	
	<hr/>	\$11,147 39
Engineering and Miscellaneous		
Expenses:		
Administration Build-		
ing . . . . .	\$1,315 10	
Advertising . . .	387 76	
Autos . . . . .	1,881 48	
Blower Exhauster		
Fans . . . . .	2,524 85	
Carbon Monoxide		
Analyzers . . .	16,094 60	
Ceiling . . . . .	328 27	
Chief Engineer . .	1,700 00	
Clerks . . . . .	2,392 84	
Construction . . .	27,384 94	
Damages . . . . .	15 00	
Electric Power Equip-		
ment . . . . .	24,529 38	
Field Supplies . . .	2,868 99	
Fuel . . . . .	420 30	
Garage — East Bos-		
ton . . . . .	38,726 10	
Inspection . . . . .	236 05	
Instruments . . .	112 07	
Labor . . . . .	42,885 85	
Lighting . . . . .	106 18	
Lighting—Construc-		
tion . . . . .	9,024 27	
Lighting—Equipment	25,535 67	
Operation of Equip-		
ment . . . . .	573 75	
Paving Roadway . .	5,171 49	
	<hr/>	
Carried forward . .	\$204,214 94	\$11,147 39

<i>Brought forward</i>	\$204,214 94	\$11,147 39
Pensioned Employees	1,091 66	
Pipe Rail Fence	2,103 42	
Police Booths	236 52	
Printing	58 58	
Professional Advice	12,235 00	
Property Repairs	27 50	
Pump Equipment	6,480 31	
Rental	2,241 50	
Rental — Yard	1,235 40	
Signal Communication Equipment	26,143 85	
Skilled Service	25,472 98	
Stationery—Supplies,	927 52	
Stenographers	656 04	
Substation Equipment	39,504 35	
Teaming	449 32	
Telephone — Telegraph	258 52	
Tiling	180,131 18	
Toll Collection		
Equipment	89,485 86	
Ventilation Building:		
Boston	30,202 84	
East Boston	22,058 05	
Equipment	60,604 13	
	<hr/>	\$705,819 47
Credits:		
Furniture	\$4 00	
Property Damages		
— Takings	156,792 79	
Tools	3,105 49	
	<hr/>	159,902 28
		<hr/>
		545,917 19

## SECTION A.

Silas Mason Co., Inc. (Contract V-8), \$298,786 05

Miscellaneous Expenses:		
Construction	\$401 03	
Field Office — Meridian Street	435 12	
Field Supplies	13 10	
Labor	7,434 17	
Lighting	189 50	
Skilled Service	281 82	
Stationery—Supplies,	46 94	
Ventilation Shaft — East Boston	3,682 23	
	<hr/>	12,483 91
		<hr/>
		311,269 96

## SECTION B.

Miscellaneous Expenses:		
Construction	\$1,018 16	
Field Supplies	9 00	
Labor	1,762 28	
Lighting	28 50	
	<hr/>	
<i>Carried forward</i>	\$2,817 94	\$868,334 54

<i>Brought forward</i> . . .	\$2,817 94	\$868,334 54
Skilled Service . . .	157 21	
Ventilation Shaft — Boston . . . . .	<u>3,331 18</u>	
		6,306 33

## SECTION C.

Miscellaneous Expenses:		
Construction . . .	\$986 15	
Labor . . . . .	456 30	
Paving . . . . .	4,166 93	
Skilled Service . . .	344 49	
Stationery—Supplies,	<u>1 60</u>	
		5,955 47

## SECTION D.

A. R. Doyle, Inc. (Contract V-66) . .	\$48,441 80	
Miscellaneous Expenses:		
Advertising . . . .	\$31 50	
Construction . . . .	204 19	
Inspection . . . . .	15 00	
Instruments . . . .	3 20	
Labor . . . . .	2,041 31	
Paving . . . . .	50,297 74	
Repairs . . . . .	8 00	
Skilled Service . . . .	2,376 24	
Stationery—Supplies,	156 77	
Stenographers . . . .	13 75	
Teaming . . . . .	336 99	
Tools . . . . .	<u>131 25</u>	
	55,615 94	
		104,057 74

*Interest.*

Interest . . . . .	318,838 00	<u>\$1,303,492 08</u>
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## TRAFFIC TUNNEL — SERIES B.

General Expenses:		
Chief Engineer . . .	\$1,102 99	
Clerk . . . . .	281 20	
Clerks and Stenog- raphers . . . . .	1,886 43	
Commissioners . . .	13,600 00	
Conveyancer . . . .	2,217 14	
Office Boy . . . . .	204 57	
Secretary . . . . .	3,607 98	
Office — Lighting . .	166 52	
Printing . . . . .	193 49	
Rental . . . . .	5,362 28	
Stationery— Supplies . . . . .	344 82	
Telephone— Telegraph, . . . . .	<u>1,398 02</u>	
	\$30,365 44	
Transfers:		
To Traffic Tunnel . . . . .	2,715 03	
	<u>\$27,650 41</u>	
From Traffic Tunnel . . . . .	8,459 97	
		\$36,110 38
<i>Carried forward</i> . . . . .		\$36,110 38



<i>Brought forward</i> . . . . .	\$36,110 38
Engineering and Miscellaneous Expenses:	
Baker, Matz & Co. (Contract V-88),	\$15,616 59
Baker, Matz & Co. (Contract V-92),	34,409 62
A. R. Doyle, Inc. (Contract V-91),	10,766 14
John J. Vicenzi (Contract V-93)	1,924 79
Advertising . . . . .	\$141 44
Autos . . . . .	1,579 38
Borings . . . . .	47 85
Chief Engineer . . . . .	4,037 50
Clerks . . . . .	3,922 08
Construction . . . . .	15,545 43
Field Supplies . . . . .	582 55
Instruments . . . . .	64 06
Labor . . . . .	31,278 41
Lighting . . . . .	292 81
Paving . . . . .	47,654 62
Printing . . . . .	240 39
Professional Advice . . . . .	8,769 40
Property Damages —	
Takings . . . . .	994,716 24
Property Repairs . . . . .	304 37
Rental . . . . .	5,787 47
Rental — Yard . . . . .	3,235 43
Skilled Service . . . . .	38,666 36
Stationery—Supplies . . . . .	639 15
Stenographers . . . . .	1,907 21
Telephone — Telegraph . . . . .	537 63
Tools . . . . .	288 45
	<hr/>
	1,160,238 23
	<hr/>
	1,222,955 37

	<i>Interest.</i>	
Interest . . . . .	44,640 00	
	<hr/>	
		\$1,303,705 75

## BOYLSTON STREET SUBWAY — CHAPTER 394 — ACTS 1930.

Engineering and Miscellaneous Expenses:		
Labor . . . . .	\$14,972 74	
Paving . . . . .	45 55	
Professional Advice . . . . .	1,672 84	
Skilled Service . . . . .	71 57	
Stationery—Supplies, . . . . .	6 68	
Telephone — Telegraph . . . . .	1 78	
Tools . . . . .	75 27	
	<hr/>	
		\$16,846 43
Credits:		
Construction . . . . .	\$10 44	
Field Supplies . . . . .	38 66	
	<hr/>	
		49 10
	<hr/>	
		\$16,797 33



## EAST BOSTON TUNNEL ALTERATIONS.

## Engineering and Miscellaneous Expenses:

Construction . . .	\$644 50
Field Supplies . . .	19 46
Labor . . .	5,288 89
Professional Advice . . .	8 00
Stationery Supplies . . .	1 50
Tools . . .	173 43

\$6,135 78

## HYDE PARK STREET RAILWAY.

## Engineering and Miscellaneous Expenses:

Property Damages — Takings . . . . .	Cr. <u>\$825 00</u>
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## SUMMARY.

	From beginning of work to Dec. 31, 1933.	Jan. 1, 1934, to Dec. 31, 1934.	Total.
Subway — Subway Com- mission . . . . .	\$14,131 16		\$14,131 16
Part of General Ex- penses . . . . .	117,550 71		117,550 71
Engineering and miscel- laneous . . . . .	407,475 48		407,475 48
Section One . . . . .	239,407 12		239,407 12
Two . . . . .	363,605 50		363,605 50
Three . . . . .	300,639 36		300,639 36
Three and one- half . . . . .	9,355 70		9,355 70
Four . . . . .	472,147 31		472,147 31
Five . . . . .	387,411 49		387,411 49
Six . . . . .	327,541 86		327,541 86
Seven . . . . .	231,504 27		231,504 27
Eight . . . . .	95,902 06		95,902 06
Eight and one- half . . . . .	76,639 47		76,639 47
Nine . . . . .	299,452 07		299,452 07
Ten . . . . .	254,497 88		254,497 88
Eleven . . . . .	270,310 57		270,310 57
Interest . . . . .	258,575 60		258,575 60
	<u>\$4,126,147 61</u>		<u>\$4,126,147 61</u>
Transfers to Alterations, see 11th report . . . . .	4 95		4 95
	<u>\$4,126,142 66</u>		<u>\$4,126,142 66</u>
Alterations — Part of Gen- eral Expenses . . . . .	\$28,945 53		\$28,945 53
Section Three . . . . .	2,568 26		2,568 26
Four . . . . .	163 42		163 42
Five . . . . .	30,233 01		30,233 01
Seven . . . . .	178,516 16		178,516 16
Nine . . . . .	3 00		3 00
Ten . . . . .	534 04		534 04
Interest . . . . .	1,905 56		1,905 56
Transfer from subway, see 11th report . . . . .	4 95		4 95
	<u>\$242,873 93</u>		<u>\$242,873 93</u>

	From beginning of work to Dec. 31, 1933.	Jan. 1, 1934, to Dec. 31, 1934.	Total.
Charlestown Bridge:			
Total . . . . .	<u>\$1,570,197 98</u>		<u>\$1,570,197 98</u>
Investigation of congestion of traffic, etc. . .	<u>\$3,015 92</u>		<u>\$3,015 92</u>
East Boston Tunnel—			
Part of General Expenses . . . . .	\$161,134 78		\$161,134 78
Engineering and Miscellaneous . . . . .	199,688 73		199,688 73
Section A . . . . .	98,869 09		98,869 09
B . . . . .	1,490,342 60		1,490,342 60
C . . . . .	508,202 77		508,202 77
D . . . . .	246,569 26		246,569 26
E . . . . .	188,307 72		188,307 72
F . . . . .	243,763 23		243,763 23
Interest . . . . .	248,156 88		248,156 88
	<u>\$3,385,035 06</u>		<u>\$3,385,035 06</u>
Boston Tunnel and Subway — Part of General Expenses . . . . .	\$226,547 21		\$226,547 21
Engineering and Miscellaneous . . . . .	420,297 83		420,297 83
Section One . . . . .	815,591 24		815,591 24
Two . . . . .	614,183 29		614,183 29
Three . . . . .	684,221 19		684,221 19
Four . . . . .	1,205,331 83		1,205,331 83
Five . . . . .	1,080,155 50		1,080,155 50
Six . . . . .	351,824 55		351,824 55
Seven . . . . .	139,723 14		139,723 14
Eight . . . . .	619,109 87		619,109 87
Nine . . . . .	679,150 23		679,150 23
Ten . . . . .	142,835 42		142,835 42
Eleven . . . . .	345,493 91		345,493 91
Twelve . . . . .	45,417 52		45,417 52
Interest . . . . .	648,179 81		648,179 81
	<u>\$8,018,062 54</u>		<u>\$8,018,062 54</u>
Cambridge Connection —			
Part of General Expenses . . . . .	\$67,261 25		\$67,261 25
Engineering and Miscellaneous . . . . .	258,911 30		258,911 30
Section One . . . . .	590,280 64		590,280 64
Two . . . . .	653,378 68		653,378 68
Interest . . . . .	76,722 00		76,722 00
	<u>\$1,646,553 87</u>		<u>\$1,646,553 87</u>
Dorchester Tunnel—Part of General Expenses . . . . .	\$197,392 47		\$197,392 47
Engineering and Miscellaneous . . . . .	833,284 86	\$106 24	833,391 10
Section A . . . . .	409,836 77		409,836 77
B . . . . .	885,488 41		885,488 41
Carried forward . . . . .	\$2,326,002 51	\$106 24	\$2,326,108 75

	From beginning of work to Dec. 31, 1933.	Jan. 1, 1934, to Dec. 31, 1934.	Total.
<i>Brought forward</i>	\$2,326,002 51	\$106 24	\$2,326,108 75
Section C . . . .	460,231 99	222 59	460,454 58
D . . . .	1,131,501 48	9 98	1,131,511 46
E . . . .	2,368,681 67		2,368,681 67
F . . . .	868,825 20	2,987 85	871,813 05
G . . . .	616,831 30		616,831 30
H . . . .	894,569 66		894,569 66
J . . . .	981,409 03		981,409 03
K . . . .	1,352,074 44		1,352,074 44
Interest . . . .	1,312,320 20		1,312,320 20
	<u>\$12,312,447 48</u>	<u>\$3,326 66</u>	<u>\$12,315,774 14</u>

Boylston Street Subway — Part of General Ex- penses . . . .	\$104,155 53		\$104,155 53
Engineering and Miscel- laneous . . . .	263,716 56	\$63 52	263,780 08
Section One . . . .	766,177 99		766,177 99
Two . . . .	1,262,690 05	3,257 15	1,265,947 20
Three . . . .	585,564 58		585,564 58
Four . . . .	1,462,030 21	1,550 79	1,463,581 00
Five . . . .	729,141 17		729,141 17
Interest . . . .	320,194 59		320,194 59
	<u>\$5,493,670 68</u>	<u>\$4,871 46</u>	<u>\$5,498,542 14</u>

Tremont Street Subway Alterations— Acts 1924 — Part of General Expenses . . . .	\$1,093 59		\$1,093 59
Engineering and Miscel- laneous . . . .	1,045 96	\$139 86	1,185 82
Construction . . . .		191 98	191 98
Adams Station . . . .	10,135 47		10,135 47
Boylston Station . . . .	3,027 86		3,027 86
Brattle Street — East- erly Platform . . . .	7,723 72		7,723 72
Hanover Street . . . .	49 10		49 10
Haymarket Station . . . .	15,161 01		15,161 01
Haymarket Station Headhouse, Change of . . . .		343 46	343 46
North Station Sub- Station . . . .	44,945 23		44,945 23
Park Street Station: North Platform . . . .	4,899 29		4,899 29
Column Changes . . . .	16,972 77		16,972 77
General . . . .	371 31		371 31
Scollay Station . . . .	788 26		788 26
Scollay Square Changes — Cambridge and Court Streets Widen- ing . . . .	7,311 84		7,311 84
	<u>\$113,525 41</u>	<u>\$675 30</u>	<u>\$114,200 71</u>

	From beginning of work to Dec. 31, 1933.	Jan. 1, 1934, to Dec. 31, 1934.	Total.
East Boston Tunnel Al- terations — Acts 1924			
— Engineering a n d			
Miscellaneous . . .	\$1,400 21	\$628 30	\$2,028 51
Construction . . .		557 78	557 78
Atlantic Station . . .	7,012 68	937 00	7,949 68
Court Street Pipe			
Crossing . . .		52 86	52 86
Devonshire Station . . .		3,716 84	3,716 84
East Boston Tunnel . .	5,701 86		5,701 86
Scollay Station . . .	68 01		68 01
Scollay Square Changes			
— Cambridge a n d			
Court Streets Widen- ing . . .	4,656 57		4,656 57
	<u>\$18,839 33</u>	<u>\$5,892 78</u>	<u>\$24,732 11</u>
East Boston Tunnel Ex- tension — Part of Gen- eral Expenses	\$38,383 04		\$38,383 04
Engineering and Miscel- laneous . . .	976,311 43		976,311 43
Section G . . .	338,014 28		338,014 28
H . . .	674,805 83		674,805 83
J . . .	135,736 74		135,736 74
Interest . . .	224,138 91		224,138 91
	<u>\$2,387,390 23</u>		<u>\$2,387,390 23</u>
Arlington Station — Part of General Expenses,	\$41,313 26		\$41,313 26
Engineering and Miscel- laneous . . .	76,614 99	\$14 47	76,629 46
Construction . . .	586,146 79	228 87	586,375 66
Extensions . . .	483,005 17		483,005 17
Interest . . .	55,738 68		55,738 68
	<u>\$1,242,818 89</u>	<u>\$243 34</u>	<u>\$1,243,062 23</u>
Dorchester Rapid Transit — Part of General			
Expenses . . .	\$210,069 67		\$210,069 67
Engineering and Miscel- laneous . . .	268,746 45	\$141 66	268,888 11
Section One . . .	2,680,958 34	21,605 16	2,702,563 50
Two . . .	1,693,848 92	5,865 04	1,699,713 96
Three . . .	1,690,712 91	3,457 44	1,694,170 35
Four . . .	1,742,580 69	3,199 47	1,745,780 16
Five . . .	2,088,457 70	617 08	2,089,074 78
Interest . . .	643,815 26		643,815 26
	<u>\$11,019,189 94</u>	<u>\$34,885 85</u>	<u>\$11,054,075 79</u>

	From beginning of work to Dec. 31, 1933.	Jan. 1, 1934, to Dec. 31, 1934.	Total.
Traffic Tunnel — Part of			
General Expenses . . . . .	\$166,814 33	\$11,147 39	\$177,961 72
Engineering and Miscellaneous . . . . .	7,507,135 24	545,917 19	8,053,052 43
Section A . . . . .	5,861,963 18	311,269 96	6,173,233 14
B . . . . .	317,691 66	6,306 33	323,997 99
C . . . . .	63,888 27	5,955 47	69,843 74
D . . . . .	28,490 37	104,057 74	132,548 11
Haymarket Square Widening . . . . .	6,631 52		6,631 52
Interest . . . . .	1,108,630 00	318,838 00	1,427,468 00
	<u>\$15,061,244 57</u>	<u>\$1,303,492 08</u>	<u>\$16,364,736 65</u>
Traffic Tunnel—Series B—			
Part of General Expenses . . . . .	\$16,062 87	\$36,110 38	\$52,173 25
Engineering and Miscellaneous . . . . .	616,242 16	1,061,321 33	1,677,563 49
Construction . . . . .		161,634 04	161,634 04
Interest . . . . .		44,640 00	44,640 00
	<u>\$632,305 03</u>	<u>\$1,303,705 75</u>	<u>\$1,936,010 78</u>
Boylston Street Subway — Chapter 394, Acts 1930 — Part of			
General Expenses . . . . .	\$57,513 80		\$57,513 80
Engineering and Miscellaneous . . . . .	240,085 58	\$1,751 09	241,836 67
Construction . . . . .	4,406,480 64	15,046 24	4,421,526 88
Interest . . . . .	209,062 50		209,062 50
	<u>\$4,913,142 52</u>	<u>\$16,797 33</u>	<u>\$4,929,939 85</u>
East Boston Tunnel Alterations — Part of General Expenses . . . . .	\$75,407 79		\$75,407 79
Engineering and Miscellaneous . . . . .	174,672 79	\$6,135 78	180,808 57
Construction . . . . .	3,412,629 01		3,412,629 01
Interest . . . . .	168,217 76		168,217 76
	<u>\$3,830,927 35</u>	<u>\$6,135 78</u>	<u>\$3,837,063 13</u>
Hyde Park Street Railway— Part of General Expenses . . . . .	\$2,195 04		\$2,195 04
Engineering and Miscellaneous . . . . .	297,189 78	Cr. \$825 00	296,364 78
	<u>\$299,384 82</u>	<u>\$825 00</u>	<u>\$298,559 82</u>
Chapter 78 — Resolves of 1913 . . . . .	<u>\$389 14</u>		<u>\$389 14</u>

	From beginning of work to Dec. 31, 1933.	Jan. 1, 1934, to Dec. 31, 1934.	Total.
Chapter 84 — Resolves of 1913 . . . . .	<u>\$636 58</u>		<u>\$636 58</u>
Dorchester Tunnel Exten- sion . . . . .	<u>\$520 19</u>		<u>\$520 19</u>
Grand Totals . . .	<u>\$76,318,314 12</u>	<u>\$2,679,201 33</u>	<u>\$78,997,515 45</u>

The report of the Chief Engineer giving the work in detail follows.

THOMAS F. SULLIVAN,  
JOHN F. McDONALD,  
ARTHUR V. SULLIVAN,  
*Commissioners.*



REPORT OF THE CHIEF ENGINEER.

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December 31, 1934.

THOMAS F. SULLIVAN, JOHN F. McDONALD AND ARTHUR V. SULLIVAN, *Commissioners, City of Boston Transit Department.*

GENTLEMEN,— I herewith submit a report on construction work done by the Department for the year ending December 31, 1934.

Work on construction of the tunnel for vehicular traffic under the harbor was continued as rapidly as possible during the first six months of the year and on June 30 it was completed and opened for public use.

Other construction work during the year has been the Haymarket Square Improvement, building a busway and overpass at Savin Hill Station of the Dorchester Rapid Transit, alterations in stairways at Fields Corner Station of the Dorchester Rapid Transit, a bridge at Cedar Grove Cemetery over the Dorchester Rapid Transit right of way, grouting at various locations in tunnels and subways of rapid transit lines.

The design of all structures, the plans and specifications for all construction work and estimates of cost have been under the supervision of Designing Engineer L. B. Howe as in the past years. The design of the electrical system of the Sumner Tunnel and the installation of that system and the ventilation system has been under direct supervision of Electrical Engineer P. L. Giering. Mr. Ralph Smillie has acted as consulting engineer on the design of the ventilation system, details of which design are contained in the annual report for the year 1933.

## SUMNER TUNNEL.

The following is a brief summary of facts pertaining to the Sumner Tunnel. Some of these items are discussed in detail in this and previous annual reports.

Length: About 5,650 feet from portal to portal.

About 6,400 feet, or a mile and one fifth, including inclines and plazas.

Construction work began March 23, 1931, completed June 30, 1934.

Cover: 20 feet of earth below the harbor bed, plus 35 feet of water at M. L. W., total 55 feet.

Grade: Boston end, 4.2 feet in 100 feet; East Boston end, 3.4 feet in 100 feet; part under harbor, 0.5 feet in 100 feet.

Width of roadway: 21 feet 6 inches.

Clearance above roadway: 13 feet 6 inches.

Diameter, outside of tunnel: 31 feet.

Ventilation: 28 large fans each of about 90,000 cubic feet per minute capacity to remove gases and fumes.

Equipment: Traffic signal lights, telephone system, fire hose, fire extinguishers and fire signals, a pumping system, devices for checking toll collections, two four-story ventilation buildings, an administration building, a garage for emergency repair trucks, toll booths and police booths.

The work on Sumner Tunnel dating from the first of the year to completion date of June 30 consisted in general of installing the interior finish in the tunnel and at the open inclines, paving North street and Cross street on account of widenings, paving the plaza and open incline at the Boston end of the tunnel, building a garage at the plaza in East Boston, building booths for collection of tolls and installing equipment for checking collections at both the Boston and East Boston ends, installing electrical and other equipment in the ventilation buildings and in the tunnel.

Placing the glazed tile on the walls in the tunnel began on the first of the year. It took about four months to complete the work, the contractor employing an average force of about sixty-five men. A detailed description of the tiling and method used for placing it is included in the annual report for the year 1933. Over 260,000 tiles, each 8 inches square, were used in this work.

Plate I shows the interior of the finished tunnel. In this view may be seen, at each side, the narrow slot or opening running the length of the tunnel for the entrance of fresh air from the duct below the roadway. The slot is between the steel plate and concrete coping about 1 foot above the roadway. Also may be seen the gratings in the roof through which the vitiated air is drawn from the tunnel into the exhaust



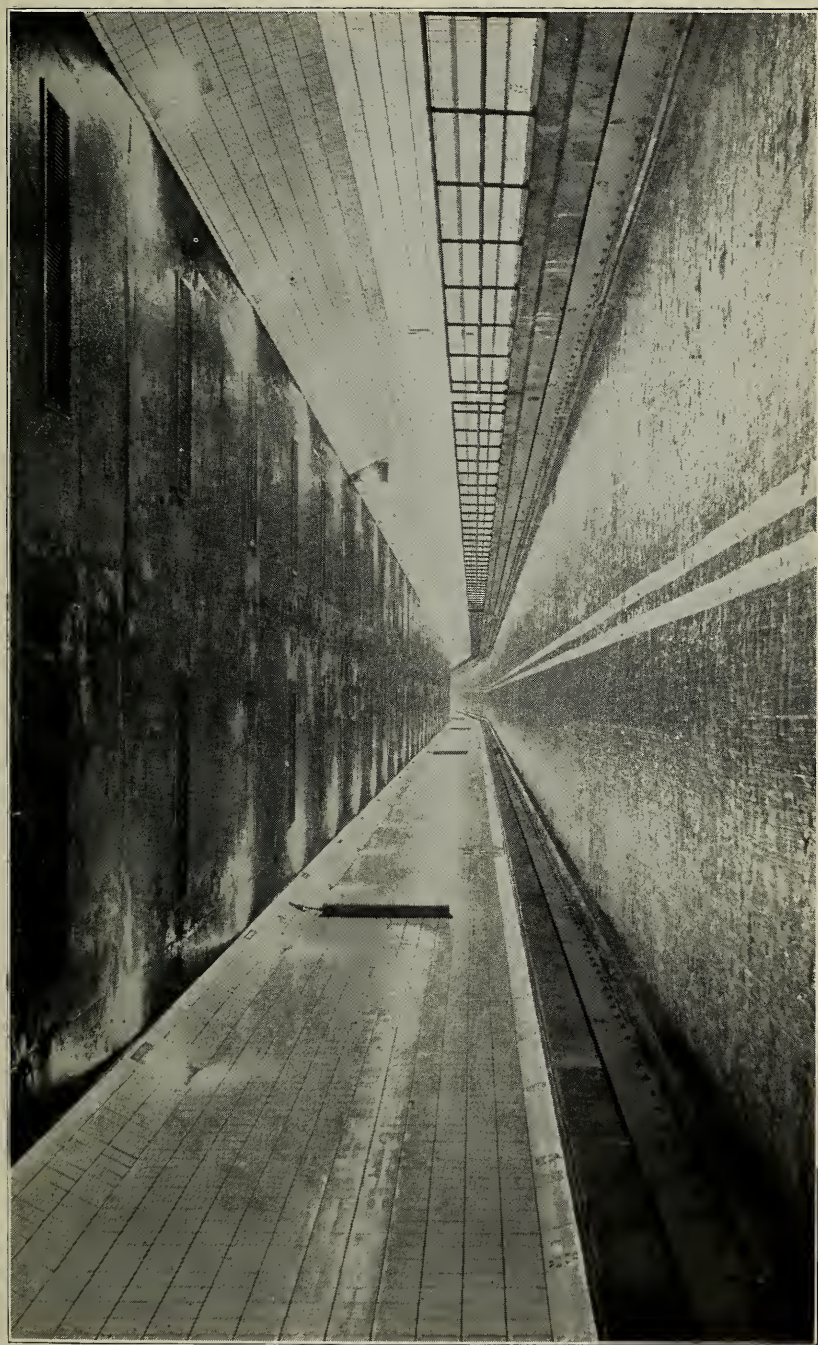


PLATE I.—INTERIOR VIEW IN FINISHED TUNNEL, LOOKING TOWARD BOSTON.



duct. A description of the ventilation system may be found in the annual report for the year 1933.

Early in the spring as soon as the frost was out of the ground the contractor for Section "D" began work of laying granite block pavement in the Boston Plaza, in North street from Union street to Cross street and in Cross street from Hanover street to Commercial street. Owing to the large volume of traffic in this vicinity it was deemed inadvisable to close these streets during paving operations. The half of the street where the widening has been made was paved first, and after the traffic could be turned on to it the remaining half was paved. The pavement consisted of granite blocks with grouted joints laid on a concrete base. This contract was finished in May.

The walls of the open incline approaches to the tunnel were lined and topped with cast stone resembling granite in appearance. The stone was furnished and set, under contract, by Carilli Construction Company.

A contract was let to J. A. Singarella for construction of a two-story garage in East Boston. This building is primarily for housing the vehicular equipment, operating from the East Boston end of the tunnel, to take care of breakdowns in the tunnel. The second story contains an office and quarters for those employees engaged especially at the East Boston end and for recording equipment for toll collections.

The contracts for installing electrical equipment by Quinn Brothers in both the East Boston Ventilation Building and Boston Ventilation Building were completed during the first part of the year.

Other electrical equipment furnished and installed during the first half of the year in the traffic tunnel and appurtenant buildings is as follows: Low tension cable, high tension cable, signal wires, traffic signals, relay panels and cabinets, equipment for operating carbon monoxide analyzers and recorders, equipment for operating drainage pumps, push-button stations and light switches, wires for lighting the tunnel and plazas.

The operation of the tunnel is dependent entirely on electric power. It operates the ventilation fans and dampers, the pumps, the traffic signals, the telephone system, the air analyzers, the toll collection equipment, the elevators, the hoists, and some of the heating. It controls all equipment and gives an indication of its operation on the control boards. Before

final plans of the electrical system were adopted much study was made to determine the best method of distributing power, the amount of voltage necessary to operate properly all equipment at all times for an indefinite period. Study was also given to the best source for obtaining electric power at reasonable and proper cost. The generating and transmission facilities of the Edison Electric Illuminating Company were carefully studied and cost of operating from that source. Studies were also made for the construction of a power plant with Diesel engines for supplying power. The result of the studies indicated that the most suitable method for obtaining the power would be to purchase it from the Edison Electric Illuminating Company. Reference was made in the last annual report to the contract with Edison Electric Illuminating Company for furnishing electric power for the tunnel. The current is received from the company on four transmission lines. Two of these lines terminate in the Boston Ventilation Building and power is received here on each of the two sections of a bus. The two other lines terminate in the East Boston Building where the power is likewise received on each of the two sections of a bus.

Plates II and III are diagrams showing the general method of distributing the power throughout the system.

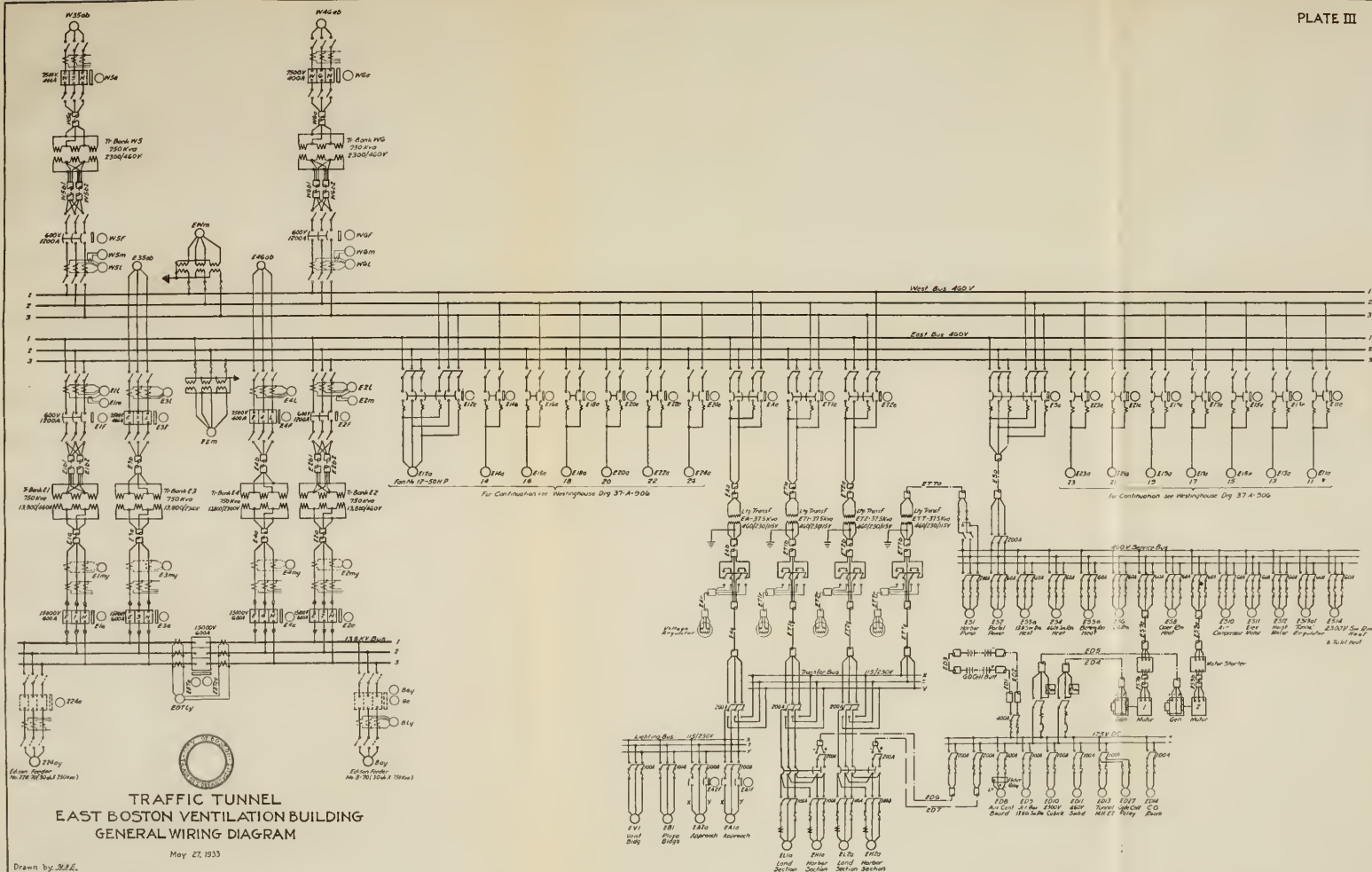
Feeding from each section of the bus in each Ventilation Building there is one feeder supplying a 750 Kv-a. step-down transformer. Both of these transformers are connected in parallel on a 460-volt bus. Also from each of the 13,800-volt buses there is fed another 750 Kv-a. step-down transformer supplying a 2,300-volt cable, which is used to transmit power to the other Ventilation Building, where the voltage is again stepped-down by 750 Kv-a. transformers which are paralleled on a single 460-volt bus. With this arrangement there is in each of the two Ventilation Buildings two 460-volt buses, one bus being supplied with power from that building while the second bus is supplied with power from the other building. All low tension feeders are connected to these buses by pairs of bus selector circuit breakers. These bus selectors are interlocked both electrically and mechanically. It may be seen from the diagrams that it is impossible to connect the transmission loop at Boston with that at East Boston. This arrangement makes it impossible to obtain back feeds to Edison lines that might be out of service. It also eliminates the necessity











Drawn by *B.A.H.*

Traced by JH. ...

Checked by: 222

*Geoffrey Compton* - *L.B. Howes* - *William H. Davis*



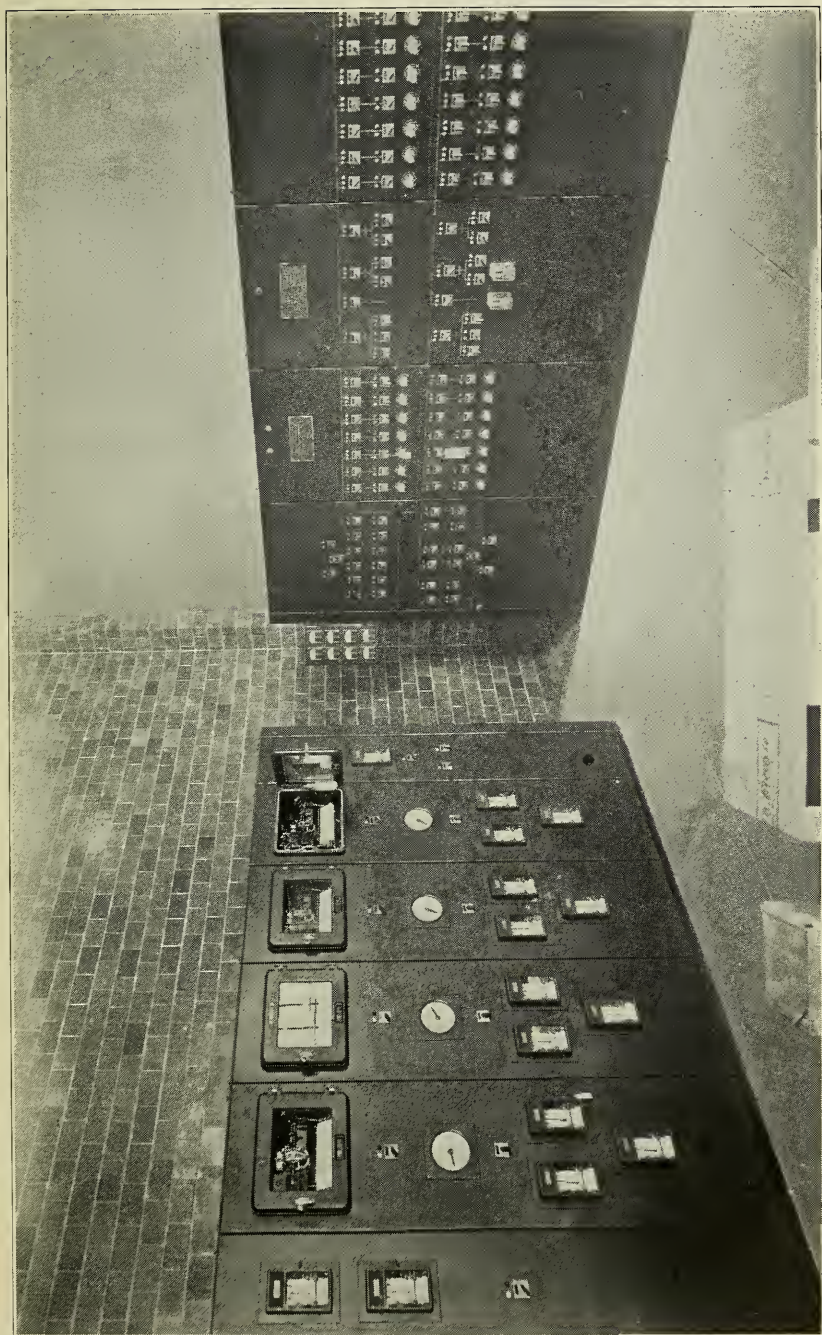


PLATE IV.—THE STRUCTURE AT THE RIGHT IS THE MINIATURE CONTROL BOARD, AND AT THE LEFT,  
THE METER BOARD IN THE BOSTON VENTILATION BUILDING.







PLATE V.—TOLL BOOTHS, ADMINISTRATION BUILDING AND INCLINED APPROACH.  
BOSTON END OF TUNNEL.





for the tunnel equipment to carry any excessive transient currents that might be caused by disturbances on the Edison Electric Illuminating Company's system.

The control of all electrically operated equipment in the tunnel and appurtenant buildings, except that of toll collecting, is centralized in a control room located in the Boston Ventilation Building. Here is a miniature control board with switches from which all electrical equipment throughout the system can be controlled. The board has signal light indications of the operations and action of the tunnel equipment. There is also in the East Boston Ventilation Building an auxiliary control which can be used to control operations in the East Boston Ventilation Building only.

On Plate IV the miniature control board in the Boston Ventilation Building is the structure at the right in the picture. The structure at the left is a meter board. It contains graphic meters for amount of carbon monoxide in the tunnel air, meters for registering the position of the air regulators in the air ducts and graphic voltmeters for ground current detection.

The amount of fresh air required for proper tunnel ventilation is determined by the amount of carbon monoxide liberated from the motor vehicles. Four analyzers for detection of and measuring in parts per 10,000, the amount of carbon monoxide present in the air of the tunnel at all times have been installed. Two are located in Boston Ventilation Building and two in East Boston Ventilation Building. Air from four locations along the exhaust duct in the tunnel is pumped continuously through pipes to the respective analyzers. A graphic indicator or potentiometer mounted on the meter board in the Boston Ventilation Building records continuously the amount of carbon monoxide in the air. If more than the allowable amount is present in any part of the tunnel more fresh air is circulated through that part of the tunnel by regulating the speed of the fans. The analyzing equipment was furnished under contract by the Mines Safety Appliance Company.

Booths for toll collections are located at the plazas in Boston and East Boston.

Plate V shows the toll booths and the Administration Building at the Boston Plaza.

Plate VI shows the East Boston Plaza, the toll booths, garage, and the incline to the tunnel. It may be seen that on each plaza there are three toll booths located under a single

canopy. Each toll booth contains two operating compartments, one for each entrance lane. The collector indicates by pushing buttons or keys in the toll booth the classification of each fare collected. There are ten classifications. The record is registered electrically by printing the collector's identification number and the amount he registers on a recorder located at a remote point from the booth, in the Administration Building at the Boston Plaza or in the garage at the East Boston Plaza. There is also indicated by a flashing light located on the top of the canopy above each lane the number corresponding to the classification of the vehicle as recorded by the collector. This enables inspectors or observers at a distance to check the record of the classification made by the toll collector, or in other words it discloses the act of registering a less amount than should have been collected.

In addition there extends across each entrance lane at right angles to the direction of the traffic a treadle or device for counting each axle as it passes over. It registers on the recorder located at the remote point as previously noted. The amount and number of tolls turned in should agree with those as registered by the push buttons. The number should also agree with those registered by the treadle.

The toll collection equipment was furnished under contract with Taller and Cooper and was installed by J. A. Singarella under the contract for building the collection booths.

Traffic signals are placed along both lanes throughout the tunnel, 202½ feet on centers. These signals are primarily for use in case of an automobile accident in the tunnel. Each unit consists of a regulation red, amber and green combination and in addition has the signal "Stop Engine." The latter is to prevent the accumulation of carbon monoxide gas and other fumes in case of a tieup in the tunnel. The signal unit also contains on the front and on the reverse side a white light for code call for police or others in the tunnel. The code light may be operated from the control room or by the police from their stations. There are the regulation traffic signal lights at the toll booths.

Spaced at intervals of 405 feet in the north wall of the tunnel are signal control niche groups. In each group are push buttons for the control of the traffic signals. There are three separate buttons, one for the control of east bound traffic, one for control of west bound traffic and one for the control



PLATE VI.—EAST BOSTON PLAZA SHOWING TOLL BOOTHS, GARAGE AND INCLINED APPROACH TO  
TUNNEL.





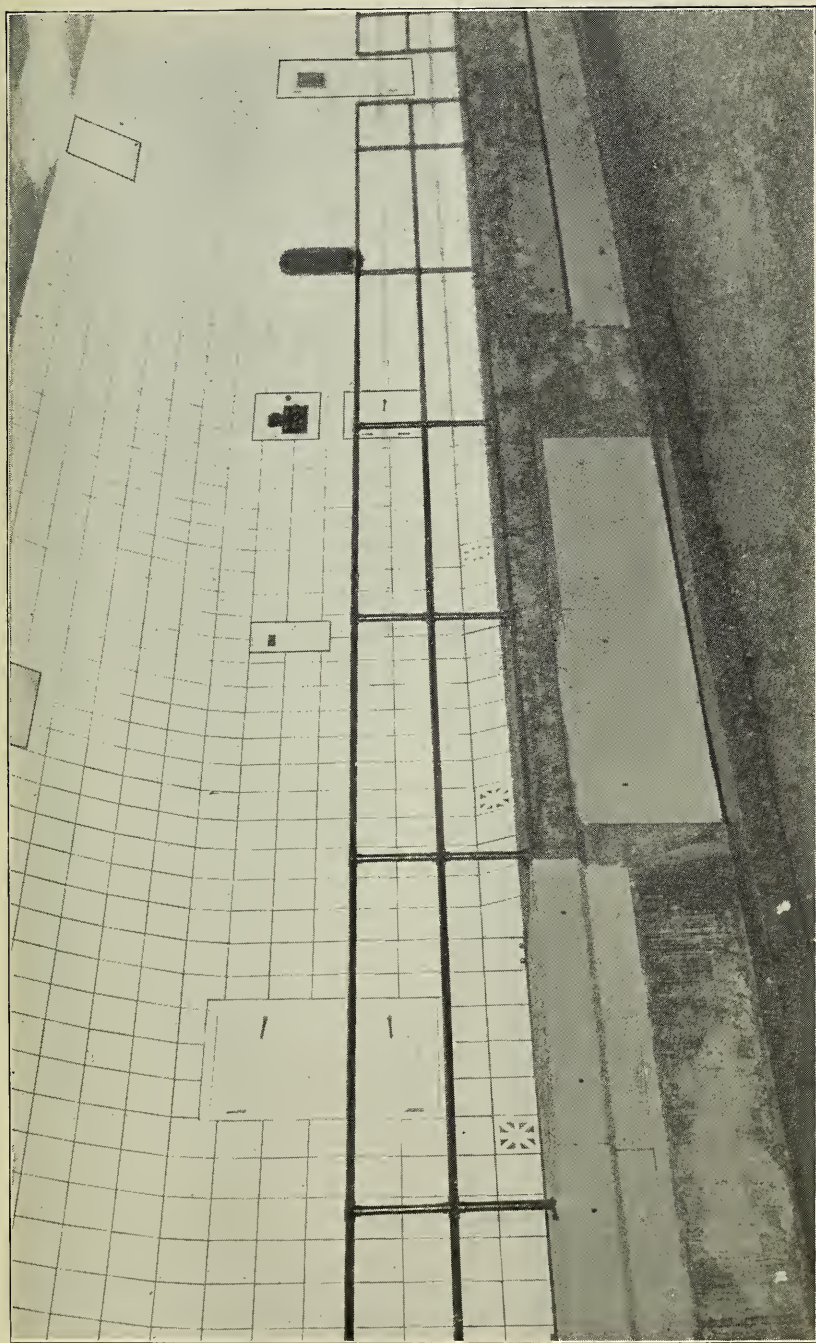


PLATE VII.—SIGNAL CONTROL NICHE GROUP IN NORTH WALL OF TUNNEL.





of all traffic. The operation of a directional traffic push button sets the lights red at that particular signal station and all lights amber to the portal at which the traffic is entering. Traffic that has already passed that certain station will continue to have green lights. The push button controlling all traffic sets the signals at each of the booths red. The set-up created by the operation of a push button controlling directional traffic can be reset by operating the push button to its normal "go" position. However, should the difficulties be of sufficient magnitude to warrant the setting of the red lights at the portal it is so arranged that an indication is obtained in the control room in the Boston Ventilation Building and these red lights can be reset to green only from that room. This arrangement permits those policing the tunnel to control the operation of the traffic signals to take care of minor difficulties. In case of major difficulties it permits the traffic in the tunnel to close up, and stops traffic from entering at the toll booths, thus making the point of trouble readily accessible from either end.

The "Stop engine" sign is controlled exclusively from the control room and when this sign is illuminated the red light comes on also, regardless of the position of the push buttons throughout the tunnel.

Plate VII shows a group of signal control niches in the tunnel, located in the north wall along the raised sidewalk. The niche at the left of the photograph contains relay equipment for the operation of the traffic signals.

The next niche is a telephone niche. The telephone system consists of an inter-communicating system of twenty-four lines throughout the tunnel, ventilation buildings, toll booths and garage. The control operator's desk is in the control room in the Boston building. This private telephone system is supplemented by lines from New England Telephone and Telegraph Company to the control room, East Boston Ventilation Building and Administration Building.

The third niche contains the push button board for operating the signals in the tunnel. There is a cut-out niche for the lighting system below it.

The next niche shown on the photograph is a police telephone box. The police telephone can be connected with police stations in Boston or in East Boston.

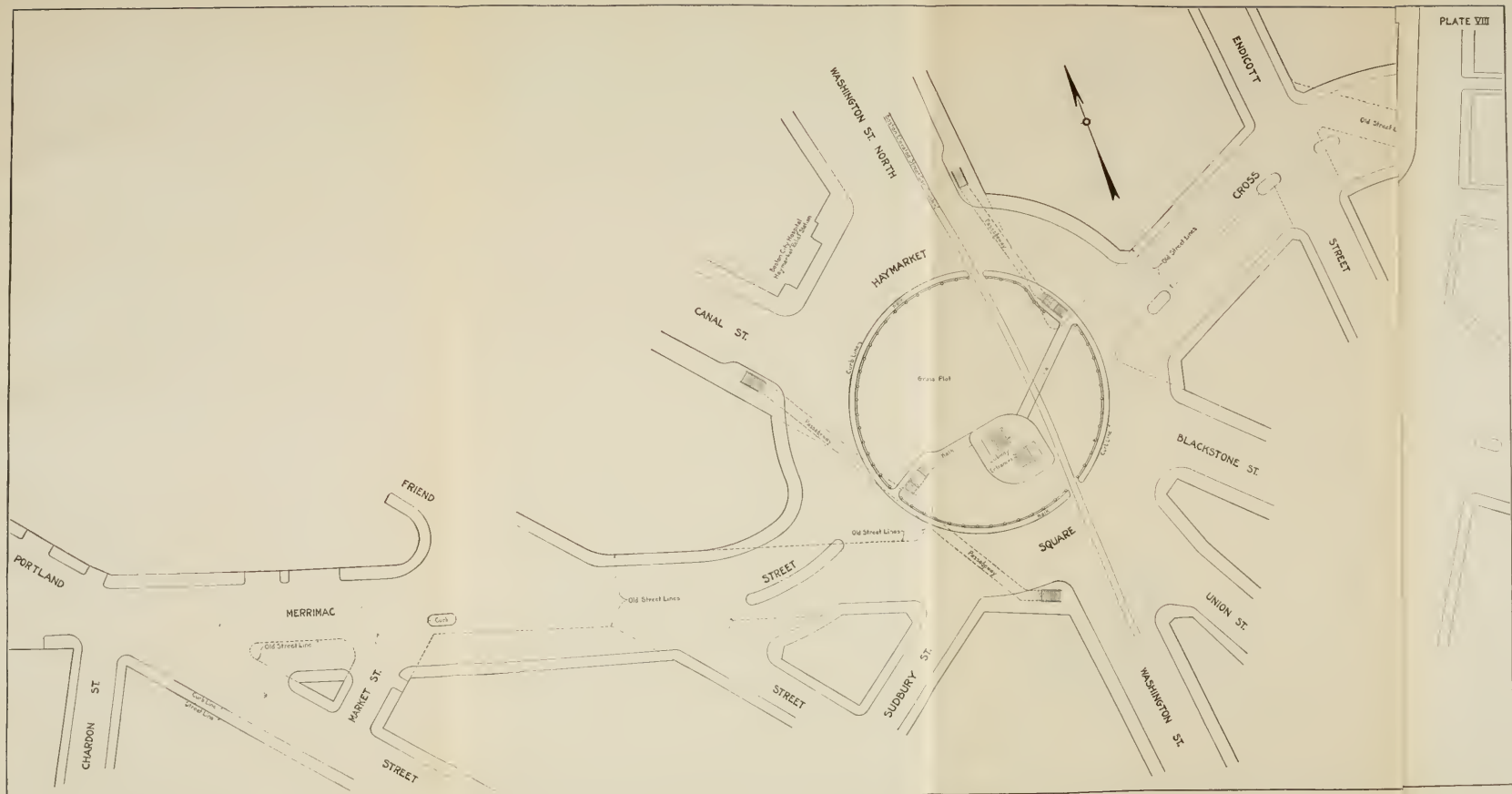
The niche at the right of the photograph is not a part of the control niche group, but contains a fire extinguisher. There are fifty-seven fire extinguishers of the carbon dioxide anti-freeze type distributed in special niches along the tunnel. They were purchased under contract from the American LaFrance and Foamite Industries, Inc.

The Fire Department of the City of Boston has placed sirens at each of the approaches and a buzzer in the control room which can be used to signal their intent to pass fire apparatus through the tunnel. A pull box has also been installed in the control room in the Boston Ventilation Building so that the department may be called to the tunnel in case they are needed.

For lighting the plazas and inclines 500-watt multiple lamps are used in octagonal luminaires of colonial design, mounted on octagonal concrete poles. A mounting height of 28 feet from the roadway has been maintained for the luminaires. Some poles carry a single arm luminaire while others have double arms with two luminaires, depending upon their location. The lighting on each approach is supplied by two cables so arranged that if one cable should be out of service the lighting is still well distributed over the approaches.

The detail of the method of lighting the tunnel was contained in the last annual report. It may be added that in order to increase the reliability of tunnel lighting, storage batteries have been provided for switch operation. The capacity of these batteries is such that they may carry one half of the tunnel lighting load for thirty minutes in case of a total failure of the electric power for the lights. In conjunction with the batteries there are two  $7\frac{1}{2}$  kilowatt motor generation charging sets and a direct current switchboard.

The Department furnished the light in the tunnel for the various contractors working on the interior finish and equipment. The power was supplied by the Edison Electric Illuminating Company under a contract for temporary lighting at 4,000 volts, 60 cycle, 3 phase, 4 wire. The voltage was not proper to operate the equipment in the tunnel and Ventilation Buildings, including the fans. By the first of the year it was essential that trucks enter the tunnel for delivery of tiling and other materials and equipment. To overcome the chances of collection of injurious carbon monoxide gas from the trucks, three transformers for the East Boston Ventilation Building





were temporarily set up on the roadway in the tunnel which enabled enough 440-volt power to be supplied from the temporary lines to operate one of the fans in the East Boston Building. The air was drawn in through the louvres in that building and discharged through the portal at the Boston end.

In March the electrical equipment in the East Boston Building was completely installed so that the building was permanently energized from the Edison Electric Illuminating Company system. This enabled testing all the fans in that building, specifications for which required a continuous ten-hour run for each fan. By installing a temporary cable through the tunnel the power was carried from the East Boston Building to the Boston Building and the fans were tested at that place under full speed. All other electrically operated equipment in both buildings had been tested from power supplied by the temporary lines. The Boston Ventilation Building was energized by Edison Electric Illuminating Company system from the Boston side, in April.

At the property lines along each side of the open incline on the East Boston side a 6-foot woven wire chain link fence was built to prevent access to the tunnel property. A similar fence was erected at the north side of the open incline approach on the Boston side and one inclosing the rear of yard of the East Boston Ventilation Building. In East Boston ornamental iron fences were erected in front of the garage on London street, one along the east side of Meridian street, over the tunnel, and one around the grass area at the south side of the plaza. In Boston an ornamental iron fence was erected in front of the Boston Ventilation Building on North street along the street line.

I make note of the fact that during construction of the traffic tunnel, an extremely hazardous undertaking, covering a period of three and one quarter years, not one fatality occurred and there were but a few minor accidents.

### HAYMARKET SQUARE IMPROVEMENT.

Plate VIII is a plan of the new Haymarket Square Improvement.

After removal of the buildings for this project on Haymarket square, Merrimac street and Cross street during the latter part of 1933, a contract was let to A. G. Tomasello & Son, Inc., for building new sewers and drains, and for filling



in the cellars of the buildings removed with gravel for the street widenings. This work was done in the spring of this year after which work on relocation of and additional underground structures by the public service companies was done. The Water Department of City of Boston laid new service and new high pressure water pipe lines in Cross street and in Haymarket square.

In May a contract was awarded to Baker, Matz & Co. for paving Cross street, from Hanover street to Haymarket square. The new street is 80 feet in width and pavement is of granite block with grouted joints laid on a concrete base reinforced with steel rods. The granite blocks used were furnished by the department obtained under contract with The Lovejoy Granite Company. Cross street was closed to vehicular traffic during the construction work. The paving was completed in May.

A contract was awarded to A. R. Doyle, Inc., for paving Merrimac street from Chardon street to Haymarket square on account of widening this part of the street to a width of 80 feet. This work was begun in June and completed in August.

A contract was let in July to Baker, Matz & Co. for building a traffic circle and repaving in Haymarket square and incidental work. The contract included the construction of two sub-passageways which are to be for the convenience and safety of pedestrians. The westerly passageway is about 250 feet in length and 8 feet wide. One stairway is located on the westerly sidewalk of Canal street near its junction with the new traffic circle and the other stairway is on the westerly sidewalk of Washington street near its junction with the circle. At about the middle of this passageway a stairway leads to an inner circle for the convenience of passengers using the Haymarket square entrance-exit of the Tremont Street Subway as well as for the pedestrians who wish to cross the circle in an easterly direction.

One stairway of the easterly sub-passageway is located on the easterly sidewalk of Washington Street North near its junction with the new traffic circle, the other stairway is in the inner circle. This sub-passageway is about 95 feet in length and 6 feet wide.

A contract for furnishing and placing the interior finish of these passageways, for the parapets around the stairways, and for a fence surrounding the traffic circle was let to John J.



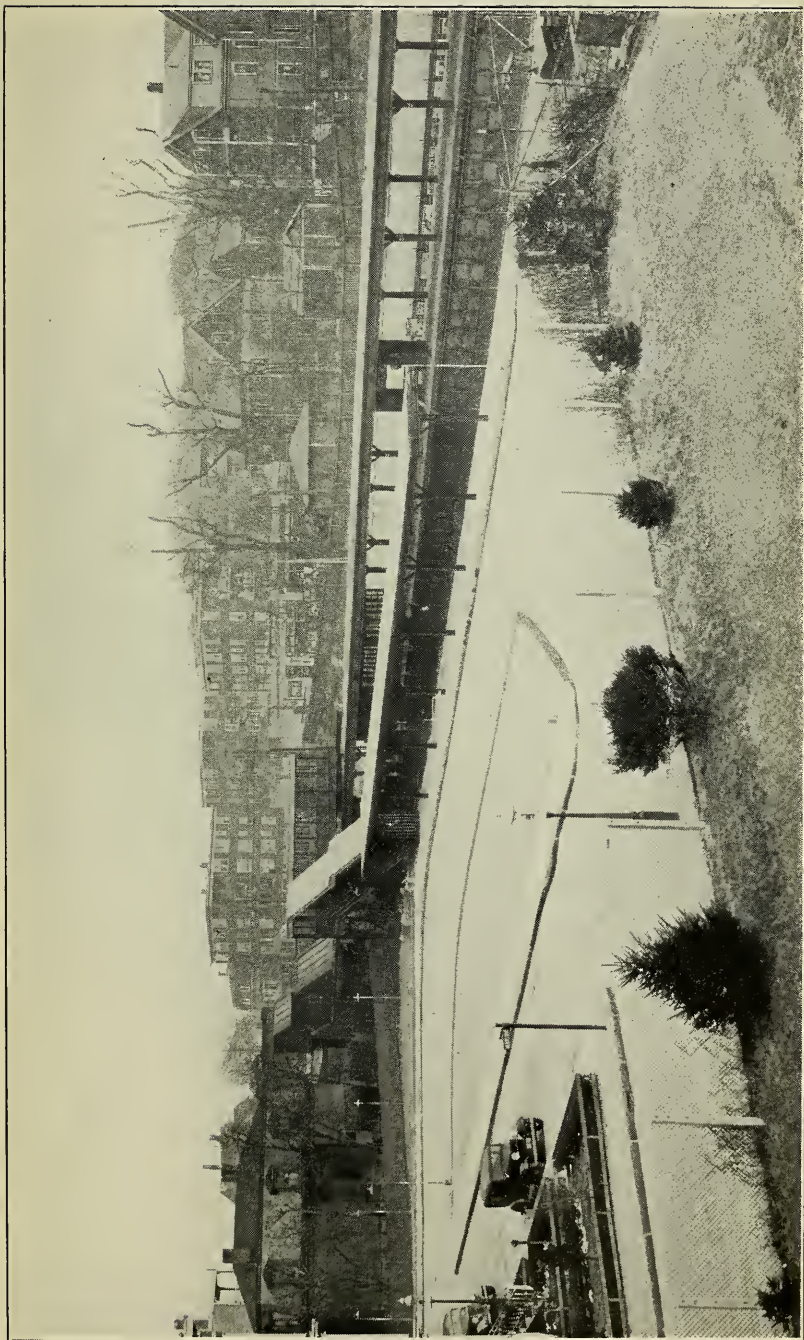


PLATE IX.—SAVIN HILL BUSWAY STATION AND OVERPASS.



Vicenzi. The walls of the passageways are being lined with 2-inch terra cotta furring blocks on which will be set vitreous enamel white metal tile and a border of black tile. The ceiling is to be of white cement plaster. Each of the five stairways is to be surrounded by a parapet made of a cast stone resembling a light granite in appearance. The inner circle will be bounded by a walk 5 feet in width just inside of which will be an ornamental fence made of cast stone posts, the space between the posts to be spanned by two lines of galvanized-iron heavy link chain. The contract is progressing at this date.

#### CEDAR GROVE CEMETERY BRIDGE.

The rapid transit right of way in the vicinity of Cedar Grove Cemetery in Dorchester near the Milton line runs through a cut bounded on both sides by the Cedar Grove Cemetery property. Access between the two parts of the cemetery for both vehicular and foot traffic is by means of a bridge spanning over rapid transit right of way. The old bridge was of wood resting on rubble masonry abutments. The superstructure had become unsafe through decay. Plans were made and a contract let to the Beacon Engineering Company for construction of a new bridge of structural steel and reinforced concrete. Construction of the new bridge was begun in April and completed in May of this year.

#### FIELDS CORNER CHANGES.

By reason of changes in fare collection equipment for passengers entering Fields Corner Station from Charles street, a request was received from the Boston Elevated Railway for changes in existing stairways and the erection of an iron fence through the center of one of the main passageways and rearrangement of turnstiles. This work was begun in October and is substantially complete at this date.

#### SAVIN HILL BUSWAY AND OTHER WORK.

Upon the request of the Boston Elevated Railway plans and specifications were made and a contract let for construction of a bus transfer station at Savin Hill on the Dorchester Rapid Transit and an overpass from the bus station to the rapid station platform.

Plate IX shows the busway station and overpass.

The location of this busway is at the corner of Bay street and South Sydney street. The project required taking two lots of land and the use of another lot already belonging to the department. The platform for the busway is of concrete, is about 125 feet in length adjacent to and parallel with the rapid transit station. The busway platform has a canopy 100 feet in length. The canopy is of hard pine supported by steel columns. The roadway for the buses enters from the dead end of Bay street, runs parallel with the new platform and then loops into South Sydney street. The roadway is of bituminous macadam.

From the westerly end of the busway platform a stairway leads to a passageway or bridge crossing over the westerly rapid transit track thence turning at right angles to a stairway leading down to the center platform of Savin Hill Station. The material is of structural steel and concrete. The construction was begun in August under contract with Baker, Matz & Co. and it was completed in December of this year.

Pertinent to the establishment of the bus transfer station there was a change in the location of the fare collection booths from the lobby at the level of Savin Hill avenue to the platform below. This change requires lengthening the platform of Savin Hill Station about 25 feet to the south. This work is special in so far as it must be done without interference to the operation of train service. It is in close proximity to the tracks and to moving trains and is being done by the labor force of the department experienced in this class of work.

During the year a small section of interior wall lining in the Massachusetts Station of the Boylston Street Subway became loose and unsafe. The glazed tile, the white cement plaster and the furring tile were removed and replaced under contract by Rinaldi Tile Company, Inc.

In December of this year a contract was awarded to M. Solimando for removal of Haymarker Square entrance and exit building of the Tremont Street Subway and building parapets around the stairways. This work has not yet been started.

In December of this year bids were received for building an extension to the canopy over the platform at Mattapan Station of Dorchester Rapid Transit. The contract for this work has not yet been awarded.



The employment of C W A painters and ironworkers which began in December of last year continued during the first part of 1934. These workers assisted in the painting and steel work in connection with the Sumner Tunnel and appurtenances.

In November and December of the current year an average of six draftsmen from the E R A were employed on retracing plans which have deteriorated through many years of use.

The labor force of the department during the year has been engaged in miscellaneous work on the various subways and tunnels. Some of the work is as follows: Setting asbestos plates in the fresh air outlet ducts in Sumner Tunnel, erecting pipe rail fence along the walk in the Sumner Tunnel and around ventilation openings in exhaust chambers in the two ventilation buildings, rodding ducts and cleaning drains in the Sumner Tunnel, repairing party walls of buildings adjacent to those removed and erecting traffic signs on account of Haymarket Square Improvement, handling construction material at the stockyard at South Boston, removing hyatt lights in sidewalk at Devonshire Street Station and replacing with granolithic, changing concrete stairways at Fields Corner Station, building extension to Savin Hill Station platform, repairs to roof of Shawmut Station on account of leaks at shrinkage joints, grouting in the East Boston Tunnel, in the Dorchester Tunnel, in the Boylston Street Subway and in the Tremont Street Subway.

The engineering force in the main office have been engaged in the design, in making detailed plans and writing specifications for various projects described in this report. Those in the field have been engaged in line and grade work, estimating quantities and inspection and direction of construction work.

During the year as fast as the completion of the various projects would allow, the department forces were reduced. The engineering force of about 86 employees was reduced over 80 per cent and the labor force of about 80 employees was reduced about 50 per cent.

Respectfully submitted,

WILBUR W. DAVIS,  
*Chief Engineer.*

CITY OF BOSTON PRINTING DEPARTMENT













